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Commission of Inquiry on Tigray Genocide

Damage and Loss Assessment (DaLA) Report on Tigray's Productive Sector and Livelihood: Effects and Impacts of the War, Siege, and Blockade

Volume 1



November, 2025 Mekelle, Tigray, Ethiopia

Damage and Loss Assessment (DaLA) Report on Tigray's Productive Sector and Livelihood: Effect and Impact of the war, Siege, and Blockade

VOLUME 1



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Finally, we salute the exceptional work of the CITG Economic Damage and Loss Assessment Research Center Researchers and Experts. Their profound expertise, meticulous analysis, and unwavering commitment to an objective account of the economic devastation were central to the report's findings and fully embody the Commission's mission.

The results presented here stand as a powerful testament to this collective effort, driven by a shared commitment to accountability and the future rebuilding of the Tigray economy

Note to the reader

This document constitutes **Volume I of the Productive Sector War Damage and Loss Assessment (DaLA) Report**. It presents verified, self-reported data from households, private firms and their respective supporting public institutions across the Tigray region. Due to constraints in temporal and geographic coverage, **subsequent volumes will follow** to incorporate additional findings.

Key considerations for interpreting this volume:

- Figures presented herein accounts for only **civilian properties and entities**, excluding any damage to military objects and infrastructure.
- **No extrapolation or estimation** has been applied. All figures reflect actual submissions, standardized only for price comparability (e.g., price of vehicles of the same model).
- The monetary values reported represent **intergenerational assets and accumulated wealth**, not annual budgets or gross domestic product figures. They should not be compared with fiscal or economic aggregates.
- **Losses far exceed visible damage**. The prolonged siege and blockade—lasting more than two years—led to widespread disruption of production goods and service and lasting setbacks in each-subsectors in the productive sector, which persisted long after the damage occurred.
- These cumulative losses, though harder to quantify, are **central to understanding the full impact of the crisis** and must inform any recovery or justice framework.
- This report is constrained to cover the following due to its institutional, temporal and geographical scope:
 - Damage and losses in the productive sector in Western Tigray are likely underreported due to ongoing security and access challenges. The figures for the Western zone in this document only reflect data from private firms that are now IDPs but survived the war.
 - Damage and loss sustained by financial SACCOs (Savings and Credit Cooperative Organizations) and Insurance companies.
 - Damage and loss to the productive sector related to the "last round war," referring to impacts that occurred outside the main November 2020–November 2023 reporting period.

Readers are encouraged to approach this volume as a foundational reference, recognizing both its rigor and its limitations. The data herein reflects lived realities and institutional memory, and its interpretation demands sensitivity to context, scale, and the enduring consequences of the war.

Table of Contents

Acknowledgements	4
Note to the reader.....	5
Table of Contents	6
List of Tables	i
List of Figures.....	ix
List of Acronyms and Abbreviations	x
Executive Summary	xii
Chapter 1 : Introduction and Context	1
1.1 Introduction.....	1
1.1.1 Background	1
1.1.2 Objective of the study	7
1.1.3 Scope of the Study	8
1.1.4 Structure of the report.....	9
1.2 Methodology	10
1.2.1 The Damage and Loss Assessment (DaLA) Framework	10
1.2.2 Target Population and Enumeration Coverage	12
1.2.3 Data Sources and Survey Tools	13
1.2.4 Damage, Loss, and Impact Valuation Methods.....	15
1.2.5 Operational definitions and measurement.....	19
1.2.6 Quality Assurance Measures.....	21
1.2.7 Assumptions and Considerations	22
1.2.8 Ethical Considerations.....	23
1.2.9 Data Management and Analysis	24
1.2.10 Limitations of the study	24
Reference	27
Chapter 2 : Damage and Loss Results	34

2.1	Damage and Loss to Household	34
2.1.1	Pre-war Context	34
2.1.2	Results	36
2.1.3	Conclusion and Recommendation	90
	Reference	92
2.2	Damage and Loss to Agriculture	95
2.2.1	Pre-war Context	95
2.2.2	Results	100
2.2.3	Conclusion and Recommendations	155
	Reference	158
2.3	Damage and Loss to Manufacturing Industry	161
2.3.1	Introduction (Pre-war Context)	161
2.3.2	Results	162
2.3.3	Conclusions and Recommendations	193
	References	197
2.4	Damage and Loss to Service	199
2.4.1	Introduction (Pre-war Context)	199
2.4.2	Results	201
2.4.3	Conclusion and Recommendation	219
2.5	Damage and Loss to Trade	223
2.5.1	Introduction	223
2.5.2	Results	224
2.5.3	Conclusion and Recommendation	264
2.6	Damage and Loss to Finance	268
2.6.1	Pre-war Context	268
2.6.2	Results	279
2.6.3	Conclusion and Recommendation	315
	Reference	318

List of Tables

Table 1. Household Heads by Zone	36
Table 2. Household Heads' Sex by Zone.....	37
Table 3. Household Heads' Location by Zone	38
Table 4. Household Heads' Religion by Zone.....	38
Table 5. Household Heads' Race by Zone.....	39
Table 6. Family Size by Zone	39
Table 7. Household Heads' Education Level by Zone	40
Table 8. Household Heads' Age by Zone.....	40
Table 9. Households by damaged assets and Damage value in 2021/2022(US\$ in Millions).....	41
Table 10. Damage value by Damage Type for Durable Assets	43
Table 11. Damage Value by Damage Severity Level for Durable Assets	44
Table 12. Damage Value by Perpetrators for Durable Assets	45
Table 13. Damage Value of Building and Building Accessories by Building Items (US\$ in Millions).....	46
Table 14. Damage Value of Buildings and Building Accessories by Damage Type (US\$ in Millions) 47	
Table 15. Damage Value of Buildings and Building Accessories by Damage Means (US\$ in Millions) 49	
Table 16. Damage to Household Housing by Damage Severity Level (US\$ in Millions)	50
Table 17. Damage to Household Housing by Perpetrators (US\$ in Millions).....	50
Table 18. Damaged Cash Crop-tree Value (2021-2022) (US\$ in Millions)	51
Table 19. Replacement Cost Value of Damaged Cash Crop-tree (US\$ in Millions).....	52
Table 20. Damaged Cash Crop Seedlings (US\$ in Millions)	53
Table 21. Crop Tool Damage Value in 2021/2022 (US\$ in Millions).....	54
Table 22. Damage Type by Crop Tools Damage Value in 2021/2022 (US\$ in Millions).....	56
Table 23. Crop Tool Damage Severity Level in 2021/2022 (US\$ in Millions).....	57
Table 24. Crop Input Damage Value in 2021/2022 (US\$ in Millions).....	59
Table 25. Damage to Crop Inputs by Damage Type (US\$ in Millions)	60
Table 26. Damage to Crop Inputs by Damage Severity Level (US\$ in millions).....	60
Table 27. Crop Input Damage by Perpetrators in 2021/2022 (US\$ in Millions)	61
Table 28. Animal Damage Value in 2021/2022 by Animal Species (US\$ in Millions)	62
Table 29. Distribution of Animal Type by Damage Type in 2021/2022 (in Quantity & Percentage).....	62
Table 30. Animal Damage by Perpetrators of Animal Type (US\$ in Millions)	64
Table 31. Damage to Veterinary Medical Equipment by Damage Type (US\$ in Millions).....	65
Table 32. Damage to Veterinary Medical Equipment by Damage Severity Level (US\$ in Millions) ..	66
Table 33. Damage to Veterinary Medical Equipment by Damage of Perpetrators (US\$ in Millions) ..	67
Table 34. Damage to Animal Input and Feed by Damage Type (US\$ in Millions)	68

Table 35. Damage to Animal Input and Feed by Damage Severity Level (US\$ in Millions)	68
Table 36. Damage to Animal Input and Feed by Damage of Perpetrators (US\$ in Millions)	69
Table 37. Quantity and Damage Value of Animal Tool in 2021/2022 (US\$ in Millions).....	69
Table 38. Damage Value of Animal Tool by Damage Type (US\$ in Millions)	70
Table 39. Damage Value of Animal Tool by Damage Severity Level (US\$ in Millions).....	71
Table 40. Damage Value of Animal Tool by Perpetrators (US\$ in Millions)	71
Table 41. Unharvested Crop Loss Value in 2021/2022 (US\$ in Millions).....	73
Table 42. Uncultivated Crop Loss Value in 2021/2022 (US\$ in Millions)	74
Table 43. Field Crop Loss Value in 2021/2022 (US\$ in Millions).....	75
Table 44. Threshing Site Crop Loss Value in 2021/2022 (US\$ in Millions).....	76
Table 45. Irrigated Vegetable Loss Value in 2022 (US\$ in Millions)	77
Table 46. Expected Loss Value of Cash Crop in 2021/2022 (US\$ in Millions).....	77
Table 47. Stored Farm Harvest Loss Value in 2021/2022 (US\$ in Millions).....	78
Table 48. Amount of Livestock Production in 2020, 2021, and 2022	79
Table 49. Livestock Production Loss in 2021/2022 (US\$ in Millions)	80
Table 50. Additional Cost Incurred by Households'	82
Table 51. Tabulation of Household Heads' Displacement	83
Table 52. Distribution of Household Heads' Pre-War Subjective Poverty by Zone	84
Table 53. Distribution of Household Heads' Post-War Subjective Poverty by Zone.....	84
Table 54. Before and after War of HH's Objective Poverty Status	84
Table 55. Distribution of HH Food Insecurity in 2012 by Zone.....	86
Table 56. Distribution of HH Food Insecurity in 2014 by Zone.....	86
Table 57. Number of Animals in 2020, 2021, and 2022 by Zone.....	87
Table 58. The Impact of War on Inflation Rate	88
Table 63. Number of assessed entities	100
Table 60. Quantity and value of Damage by Item (values in Million US \$)	101
Table 61. Damage by Building and Building Accessories (US\$ in Millions)	103
Table 62. Damage to Building and Building parts by Damage type (US\$).....	104
Table 63. Damage to Building and Building Parts by Damage Severity Level (US\$ in Millions)	104
Table 64. Damage of Building and Building parts by Means of Damage (US\$ in millions)	105
Table 65. Damage to Building and Building parts by Perpetrators share (US\$ in Millions).....	106
Table 66. Damage by Vehicle Type (US\$ in Millions)	106
Table 67. Damage to Vehicles and vehicle spears by Damage Type (US\$ in Million).....	107
Table 68. Damage to Vehicles and vehicle spears by Damage Severity Level (US\$ in Million)	108
Table 69. Damage to Vehicles and vehicle spears by Means of Damage (US\$ in Million).....	108
Table 70. Damage to Vehicles and vehicle spears by Damage Perpetrators (US\$ in Million).....	109
Table 71. Damage to Durable Properties by Damage Type (US\$ in Million).....	110

Table 72. Damage to Durable Properties by Damage Severity Level (US\$ in Million).....	110
Table 73. Damage to Durable properties by Means of Damage (US\$ in Million)	111
Table 74. Damage to Durable properties by Damage Perpetrators (US\$ in Million)	111
Table 75: Damage Value of Consumables by Perpetrators (US\$ in Millions)	112
Table 76: Type, quantity, monetary value, frequency and proportion of damage AI equipment	114
Table 77. Damage of Veterinary properties by Damage type, Damage severity, Perpetrators and Means of Damage (US\$ in Millions)	116
Table 78: Damage of Animals by animal categories and Damage Value (US\$ in Million).	118
Table 79. Damage to Animals by Perpetrators, Execution type and Severity (US\$ in Million)	119
Table 80. Damage to Animals by Perpetrators, Execution type and Severity (US\$ in Million)	120
Table 81. Damage to Animals by Perpetrators, Execution type and Severity (US\$ in Million)	120
Table 82. Damage to Animals by Perpetrators, Execution type and Severity (US\$ in Million)	121
Table 83. Damage to Animals by Perpetrators, Execution type and Severity (US\$ in Million)	121
Table 84: Animal Product by Damage Value (US\$ in Millions).....	122
Table 85. Damage of Animal Products by damage type (US\$ in Millions)	123
Table 86. Damage of Animal Products by Means of Damage (US\$ in Millions)	124
Table 87. Damage of Animal Products by Damage Severity Level (US\$ in millions)	124
Table 88. Damage of Animal product by Perpetrators (US\$ in Millions)	124
Table 89. Damage to Cereals by Damage Value (US\$ in millions)	125
Table 90. Damage to Cereal products by damage type (US\$ in Millions)	126
Table 91. Damage to cereal products by Means of damage (US\$ in Millions)	126
Table 92.Damage to Cereal products by Damage severity Level (US\$ in Millions).....	127
Table 93. Damage to Cereal products by Perpetrators (US\$ in Millions)	127
Table 94: Damage to Vegetables by Damage Value (US\$ in Millions)	127
Table 95. Damage to vegetables by damage Type (US\$ in Millions)	128
Table 96. Damage to vegetables by Means of Damage (US\$ in Millions).....	129
Table 97. Damage to vegetables by damage Perpetrators (US\$ in Millions)	129
Table 98: Damaged Type of Pulse and Oilseeds by Damage Value (US\$ in millions).....	130
Table 99. Damaged Type of Pulse and Oilseeds by Damage Type (US\$ in millions)	131
Table 100. Damaged Type of Pulse and Oilseeds by Means of damage (US\$ in millions)	131
Table 101. Damaged Type of Pulse and Oilseeds by Damage Severity Level (US\$ in millions)	132
Table 102.Damaged Type of Pulse and Oilseeds by Damage Perpetrators (US\$ in millions)	132
Table 103: Damaged Types of Fruits by Damage Value (US\$ in Millions).....	132
Table 104. Damage to Fruits by Damage type (US\$ in Millions)	133
Table 105.Damage to Fruits by Means of damage (US\$ in Millions)	134
Table 106.Damage to Fruits by Damage Severity Level (US\$ in Millions).....	134
Table 107. Damage to Fruits by Damage Perpetrators (US\$ in Millions)	135
Table 108: ICT assets and infrastructure by Damage Value (US\$ in Millions)	135

Table 109. ICT assets and infrastructure by Damage Type (US\$ in Millions).....	136
Table 110. ICT assets and infrastructure by Means of Damage (US\$ in Millions)	136
Table 111. ICT assets and infrastructure by Damage Severity Level (US\$ in Millions).....	136
Table 112. ICT assets and infrastructure by Damage Perpetrators (US\$ in Millions).....	137
Table 113: Electrical Assets and Infrastructure by Damage Value (US\$ in Millions)	137
Table 114. Damage to Electrical Equipment's by Damage type (US\$ in Millions)	138
Table 115. Damage to Electrical Equipment's by Means of damage (US\$ in Millions).....	139
Table 116.Damage to Electrical Equipment's by Damage Severity Level (US\$ in Millions)	139
Table 117. Damage to Electrical Equipment's by Damage Perpetrators (US\$ in Millions).....	140
Table 118. Damage to FTC Assets and Infrastructure by Damage value(US\$ in Millions).....	140
Table 119. Damage to FTC Assets and Infrastructure by Damage Type(US\$ in Millions)	141
Table 120. Damage to FTC Assets and Infrastructure by Means of damage (US\$ in Millions)	141
Table 121. Damage to FTC Assets and Infrastructure by Damage Severity Levele(US\$ in Millions)	142
Table 122. Damage to FTC Assets and Infrastructure by Damage Perpetrators (US\$ in Millions) ...	142
Table 123: Damage to Documents, archives and books by Damage value (US\$ in Millions)	143
Table 124. Damage to Documents, archives and books by Damage type (US\$ in Millions).....	143
Table 125. Damage to Documents, archives and books by Means of Damage (US\$ in Millions)	144
Table 126. Damage to Documents, archives and books by Damage Severity Level (US\$ in Millions)	144
Table 127. Damage to Documents, archives and books by Damage Perpetrators	144
Table 128. Damage to Inputs and Feed by Damage Value (US\$ in Millions)	145
Table 129.Damage to Inputs and Feed by Damage type (US\$ in Millions)	146
Table 130.Damage to Inputs and Feed by Means of Damage (US\$ in Millions)	147
Table 131. Damage to Inputs and Feed by Damage Severity Level (US\$ in Millions).....	147
Table 132.Damage to Inputs and Feed by Damage Perpetrators (US\$ in Million)	147
Table 133. Damage to Hazardous materials and wastes by Damage Value (US\$ in Millions).....	148
Table 134. Damage to Hazardous materials and wastes by Damage type (US\$ in Millions).....	149
Table 135. Damage to Hazardous materials and wastes by Means of damage (US\$ in millions).....	149
Table 136. Damage to Hazardous materials and wastes by Damage Perpetrators (US\$ in Millions)	150
Table 137. Loss category and monetary values over three consecutive years and by type of ownership (US\$ in millions).....	150
Table 138. Estimated Damage to Manufacturing Infrastructure and Assets by Item Type.	164
Table 139. Estimated Damage to Manufacturing Infrastructure and Assets by Damage Type (Value in Million USD).	167
Table 140. Estimated Damage to Manufacturing Infrastructure and Assets by Means of Damage (Value in Million USD).	169
Table 141. Estimated Damage to Manufacturing Infrastructure and Assets by Severity of Damage (Value in Million USD).	172

Table 142. Estimated Damage to Manufacturing Infrastructure and Assets by Perpetrator (Value in Million USD).	175
Table 143. Unforeseen cost of the manufacturing sector (US\$ in Millions)	185
Table 144. Government loss of the Bureau of Industry and Investment Commission (US\$ in Millions) 188	
Table 145. Risks and Vulnerabilities of Bureau of Industry and Investment commission (US\$ in millions)	189
Table 146. Impact of war on macro-economic variables (US\$ in Millions).....	192
Table 147: Sectoral Distribution and Growth of Tigray Economy (2016 to 2020)	199
Table 148: International Tourist Statistics in Tigray (2009 to 2020).....	200
Table 149: Zonal Distribution of Collected Data.....	201
Table 150: Damage of Items by damage Value (US\$ in millions)	203
Table 151: Damage to Building by Means of Damage (US\$ in Millions)	204
Table 152: Damage to Building by Damage Severity Level (US\$ in Millions)	205
Table 153: Damage to building by Perpetrators (US\$ in Millions)	205
Table 154: Damage to Vehicles and vehicle Parts by Damage type (US\$ in millions).....	206
Table 155: Damage to Vehicles and vehicle Parts by Damage Severity Level (US\$ in millions)	207
Table 156.Damage to Vehicles and vehicle Parts by perpetrators (US\$ in millions)	207
Table 157: Damage to Electronic and Electrical Equipment by Damage type (US\$ in Millions)...	208
Table 158. Damage to Electronic and Electrical Equipment by Damage Severity Level (US\$ in Millions).....	209
Table 159: Damage to Electronic and Electrical Equipment by Perpetrators (US\$ in Millions)	209
Table 160: Means of Committing the Damage on the Durable Goods	210
Table 161. Damage to Durable Goods by Damage Severity Level(US\$ in Millions).....	210
Table 162: Damage to Durable Goods by Perpetrators (US\$ in Millions)	211
Table 163. Damage to Goods in Transport and Transit by Perpetrators (US\$ in Million)	211
Table 164: Damage/Execution Type on Chemicals.....	212
Table 165: Perpetrators of Damage to Chemicals	213
Table 166: Damage Type on Consumable Goods.....	213
Table 167. Level of damage to the Building.....	214
Table 168. Executors of damage on consumables	214
Table 169: Damage Type on Waste Disposal	215
Table 170. Loss Value to Productive Service Sector (US\$ in Millions).....	215
Table 171. Impact of the war on Productive Service sector (US\$ in Millions)	217
Table 172. Zonal (Geographic Distribution) of affected firms.	224
Table 173. Affected Firms by their legal business formation.	224
Table 174. Affected business by their levels of Business.....	225
Table 175. Affected Firms by Source of Start-up Capital.	225

Table 176. Operational Status of Firms before the War.	225
Table 177. Current Working Capacity Firms as Compared to Pre-war Capacity.....	226
Table 178. Employee's status of the affected firms.....	226
Table 179. Damage Value for the Trade sector by Items (US\$ in million)	227
Table 180. Damage of Building and Building Accessories by damage type (US\$ in Millions).....	228
Table 181. Damage to Building and Building accessories by Means of damage Executions (US\$ in Millions).....	229
Table 182. Damage to Building and Building accessories by damage Severity Level (US\$ in Millions) 229	
Table 183. Damage to Building and Building accessories by Perpetrators (US\$ in Millions).....	230
Table 184. Damage of Vehicles by damage type (US\$ in Millions)	231
Table 185. Damage to Vehicle by Means of damage Executions (US\$ in Millions)	232
Table 186. Damage to Vehicle by Damage severity Level (US\$ in Millions)	234
Table 187. Damage to Vehicles by Share of Perpetrators (US\$ in Millions)	234
Table 188. Damage to Fixed Equipment by Damage Type (US\$ in Millions).....	235
Table 189. Damage to Fixed Equipment by Means of Damage Execution (US\$ in Millions).....	236
Table 190. Damage of Fixed Equipment by Damage Severity Level (US\$ in Millions)	236
Table 191. Damage of Fixed Equipment by Damage Perpetrators (US\$ in Millions)	237
Table 192. Damage to Office furniture by Damage Type (US\$ in Millions)	238
Table 193. Damage to office Furniture by Means of Damage Executions (US\$ in Millions).....	239
Table 194. Damage to Office Furniture by Damage Severity Level (US\$ in Millions)	240
Table 195. Damage to Office Furniture by Damage Perpetrators (US\$ in Millions)	241
Table 196. Damage to Electrical Equipment's by Damage Type (US\$ in millions)	242
Table 197. Method of damage employed on electrical equipment by perpetrators	242
Table 198. Level of Damage occurred on the Electrical Equipment	243
Table 199. Perpetrators of the damage on electrical equipment	243
Table 200. Type of damage on ICT Equipment.....	244
Table 201. Method of damage employed on ICT equipment	244
Table 202. Level of damage occurred on ICT equipment	245
Table 203. Perpetrators of the damage on ICT Equipment.....	246
Table 204. Type of Damage occurred on Goods in Transit.....	246
Table 205. Method of Damage adopted for the goods in Transit	247
Table 206. Perpetrators of the damage to the goods in transit	248
Table 207. Damage Type occurred on consumable and finished goods	249
Table 208. Method of Damage employed by perpetrators on consumables	249
Table 209. Level of Damage occurred on consumables	250
Table 210. Perpetrators of damage to consumable goods	251
Table 211. Type of Damage occurred on Dangerous chemicals.....	252

Table 212. Method of Damage adopted on dangerous chemicals	253
Table 213. Level of Damage on dangerous chemicals	253
Table 214. Perpetrators of the damage on dangerous chemicals	254
Table 215. Type of Damage to the Waste Disposal Equipment	254
Table 216. Method of Damage to Waste Disposal Equipment.....	255
Table 217. Level of Damage occurred on waste disposal equipment	255
Table 218. Perpetrators of the damage to Waste Disposal Equipment	256
Table 219. Type of Damage to the Merchandise Goods.....	256
Table 220. Method of Damage to the Merchandised Goods	257
Table 221. Level of Damage occurred to the Merchandise Goods.....	258
Table 222. Perpetrators of the damage to the Merchandise Goods.....	258
Table 223. Type of damage to the Machine and Machinery.....	259
Table 224. Method of Damage employed on Machine and Machinery.....	260
Table 225. Level of Damage occurred to the Machine and Machinery.....	260
Table 226. Perpetrators of the damage to the Machine and Machinery.....	261
Table 227. Loss Value of the Trade sector (US\$ in Million).....	261
Table 228. Loan Disbursement Status of Banks in Tigray before the War	272
Table 229. Outreach of Microfinance Institutions in Tigray	275
Table 230. Deposit Mobilization Status of MFIs in Tigray before the War	276
Table 231. Deposit Mobilization Status of Banks in Tigray before the War.....	278
Table 232. Respondent Bank Branches Categorized by Zone	279
Table 233. Respondent MFI Branches Categorized by Zone	280
Table 234. Estimated Damage Amount for Affected Bank Buildings (US\$ in Millions)	281
Table 235. Types of Damage Execution, Bank Buildings (US\$)	282
Table 236. Level of damage by Building site (US\$)	282
Table 237. Banks Building Damage by Perpetrators (US\$ in Millions)	283
Table 238. Total Replacement Cost for Damaged Bank Buildings (US\$ in Millions).....	284
Table 239. Damage to Cash and Inventory of stock by Location (US\$ In millions).....	284
Table 240. Type of Damage Execution of Cash and inventory (US\$ in Millions).....	285
Table 241. Perpetrators of Bank Cash and Inventory (US\$)	287
Table 242. Type of Damage Execution to Bank FFE (%)	288
Table 243. Damaged Bank FFE by Damage severity Level and Zone	289
Table 244. Damage to FFE by Perpetrators (US\$ in Millions).....	290
Table 245. Damage to Bank Vehicles and Generators by Means of damage(US\$ in Millions).....	291
Table 246. Damage to Bank Vehicles and Generators by Damage Severity Level (US\$ in Millions)	292
Table 247. Damage to Bank ICT Resources by Means of Damage (US\$ in Millions)	294
Table 248. Damage to Bank ICT Resources by Damage Severity Level (US\$ in Millions).....	295

Table 249. Damage to Bank ICT Resources by Perpetrators (US\$ in Millions)	296
Table 250. Damage to Building and Building parts of MFI by Value (US\$ in Millions)	297
Table 251. Damage to Building and Building parts of MFI by Damage severity Level (US\$ in Millions).....	299
Table 252. Damage to MFI Buildings by Share (US\$ in Millions)	300
Table 253. Professional consultancy cost for MFI Buildings (US\$ in millions)	300
Table 254. Summary of replacement cost for damaged MFI Buildings and Guard Houses (US\$ in millions)	300
Table 255. Looted MFI Cash and Inventory categorized by Zone (US\$ in millions)	301
Table 256. Damage to Cash and inventory by Perpetrators (US\$ in millions).....	302
Table 257. Current Replacement Cost of Damage FFE_ DECSI & AMFI (US\$ in Millions).....	304
Table 258. Replacement cost of damaged Sales Counter, Cashier's Box, and Curtains	304
Table 259. Damage of FFE by perpetrators (US\$ in Millions).....	306
Table 260. Current replacement cost of damaged MFI Vehicles and Generators (US\$ in Millions) .	307
Table 261. Summary of perpetrators: MFI Generators and Vehicles	308
Table 262. Estimated replacement cost for the overall ICT Items - MFI (US\$ in Millions)	309
Table 263. Damage to ICT infrastructure for MFI by Perpetrators (US\$ in Millions).....	310
Table 264. Loss value of Financial Institution (US\$ in millions).....	311
Table 265. Outreach and Resource Mobilization of Banks	313
Table 266. Loan Portfolio and Profitability of Banks.....	313
Table 267. Outreach and Resource Mobilization MFI.....	314
Table 268. Loan Portfolio and Profitability of MFI.....	314

List of Figures

Figure 1. Geographical Scope of DaLA Assessment.....	8
Figure 2: Destroyed Building Status (US\$ in Millions).....	47
Figure 3: Damage Value by Perpetrators (US\$ in Millions).....	58
Figure 4: Summary of the inflation rate in percentage for basic food items.....	89
Figure 5: Distribution of Firms by Form of Business (Left panel), Firm Size (Right panel), Size of Business	101
Figure 6: Damaged Consumables (A), Damage Type, (B) Execution Type and (C) Damage Severity 113	
Figure 7: Perpetrators, Damage type, Means of Damage and Damage severity level of AI equipment (US\$ in Millions)	115
Figure 8: Members the Eritrean Defense forces tracking equines carrying looted assets in Axum, Tigray.....	148
Figure 9 Damage value by ownership (US\$ in Millions)	152
Figure 10: Change in Unemployment Rate over the War-Year versus Base Year (2020).	153
Figure 11. Zonal Distribution (a) and Pre-War Functionality (b) Status of Assessed Firms	162
Figure 12. Distribution of Firms by Establishment (a), Firm Size (b), Subsector (c), and (d) Capital Source.	163
Figure 13. Comparison of pre- and post-war profit (Birr)	184
Figure 14. Employment in the manufacturing sector.....	191
Figure 15: Firms profile A. Firm Structure, B. Firm Size, C. Source of Capital/Finance	202
Figure 16: Type of Annual Deposit in Proportion	272
Figure 17: Perpetrators – Bank Vehicles and Generators	293
Figure 18: Means of Damage execution Building of MFI (%).....	298

List of Acronyms and Abbreviations

AFF / AFR	Afar Forces / Afar Regional Forces
AI	Artificial Insemination
AMF / AMH	Amhara Forces / Amhara Militia Forces / Amhara Regional Forces
AMFI	Adeday Microfinance Institution S/C
BMJ	British Medical Journal
BoA / BoANR	Bureau of Agriculture / Bureau of Agriculture and Natural Resources
BOQ	Bill of Quantities
CBE	Commercial Bank of Ethiopia
CITG	Commission of Inquiry on Tigray Genocide
CSA / ECSA	Central Statistical Agency (Ethiopia) / Ethiopian Central Statistics Agency
DaLA	Damage and Loss Assessment
DAP	Di-Ammonium Phosphate
DBE	Development Bank of Ethiopia
DECSI	Dedebit Credit and Savings Institution S/C
E.C. / E.C	Ethiopian Calendar
EDF	Eritrean Defence Force
EFP	Ethiopian Federal Police / Eritrean Federal Police
ENDF	Ethiopian National Defence Force
EPRDF	Ethiopian People's Revolutionary Democratic Front
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
FFE	Furniture, Fixtures, and Equipment
GDP	Gross Domestic Product
h / ha	Hectare
HH / HHs	Household / Households
ICG	International Crisis Group
ICT	Information and Communications Technology
IDPs	Internally Displaced Persons
IPC	Integrated Food Security Phase Classification
IRF	Irregular Armed Forces / Illegal Forces / Interim Regional Forces
IVS	International Valuation Standards
LN2	Liquid Nitrogen
MFI(s)	Microfinance Institution(s)
MoA	Ministry of Agriculture
N/West	North West
NBE	National Bank of Ethiopia
NPL	Non-Performing Loan
ORM	Oromia Regional Forces
PDNA	Post-Disaster Needs Assessment
PLC / PLCs	Private Limited Company / Public Limited Companies

PP	Prosperity Party
PSNP	Productive Safety Net Programmed
SACCOs	Savings and Credit Cooperatives
SLM	Sustainable Land Management
SWC	Soil and Water Conservation
TARI	Tigray Agricultural Research Institute
TATC	Tigray Agricultural Transformation Center
TBoPF	Tigray Bureau of Plan and Finance
TCMPA	Tigray Cooperative and Market Promotion Agency
TIC	Tigray Investment Commission
TLU	Tropical Livestock Unit
TPLF	Tigray People's Liberation Front
UN	United Nations
UNDP	United Nations Development Programme
UN-ECLAC / ECLAC	United Nations Economic Commission for Latin America and the Caribbean
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UNISDR	United Nations International Strategy for Disaster Reduction
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
UPS	Uninterruptible Power Supply
US\$ / USD	United States Dollar
VAT	Value-Added Tax
Vet	Veterinary
WFP	World Food Programme
WWII	World War II

Executive Summary

Introduction

This report presents the assessment results of the economic damage and loss caused by the war and siege in Tigray, Ethiopia, a region that has experienced a long history of war and poverty. The assessment used a comprehensive and multidimensional approach to measure the physical and economic impacts of the war on various productive sectors and dimensions, such as manufacturing, trade, productive services, agriculture, financial institutions, and households. The assessment covered the period from November 2020 to August 2022 for the households and from November 2020 to December 2023 for sector assessments, excluding some areas that were inaccessible or unsafe due to security issues. Due to security and full siege reasons, the assessment result of damage, loss, and impact is based on the limited information extracted from 657,360 (47%) household heads, 55,271 private firms, and seven government offices.

The DaLA methodology outlines the systematic process for assessing the physical damage and subsequent economic losses across the Tigray Regional State resulting from the recent war, siege, and blockage. It is structured to adhere to internationally recognized frameworks, specifically the Damage and Loss Assessment (DaLA) methodology developed by UN-ECLAC and used within the Post-Disaster Needs Assessment (PDNA) framework of the World Bank, UN, and UNDP (World Bank, UN, & EC, 2013; UN-ECLAC, 2014).

Assessment Methodology

The extensive geographical scope of the war necessitates an exhaustive approach to ensure an accurate estimation of the total impact.

Sampling Technique: Census-Based Assessment

Given that virtually every administrative area in Tigray was affected by the war, siege, and blockade, the assessment adopted a census-based assessment approach, aiming for universal coverage across all sectors and geographic areas (World Bank, UN, & EC, 2013).

The assessment utilized a phased approach that acknowledged the operational realities of a post-conflict environment. The initial effort involved rapidly conducting a census of damage and loss across all then-accessible zones to establish baseline recovery requirements, with the

explicit understanding that the resulting aggregate figures represented a partial estimate of the total impact. Due to persistent security and logistical challenges, the subsequent plan to mobilize and assess the remaining inaccessible areas is currently pending. Consequently, the data presented in this report only constitutes Volume 1 of the final assessments, as comprehensive damage and loss values remain incomplete until security issues permit the collection of critical data from the unassessed zones.

Target Groups and Data Sources

Data collection was designed to source information from diverse groups and institutions to ensure a comprehensive view of the damage to assets and the resulting flow losses across the economy.

Table 1A: Target Group for the Assessment and Data Sources

Target Group/Data Source	Categorization	Role in Assessment (Action Completed/Established)
Households (HHs)	Primary victims and economic agents	The assessment has focused on identifying damage to residential property, personal assets, and human capital, alongside the loss of income and livelihoods.
Government Institutions	Public sector infrastructure and services	The team has measured damage to public assets (office equipment, agricultural facilities, vehicles, utilities, and administrative buildings) and the resulting loss of public service provision.
Private Firms	Core economic sectors	The assessment has quantified damage to production assets and inventory and the resulting loss of output/sales.
Categorization of Private Firms:	Agriculture, Trade, Productive Service, Manufacturing, Finance Sectors	The methodology has established detailed sector-specific approaches for calculating damage and loss.
Regional State Data	Secondary and macro-level data	The team has utilized official records on infrastructure, public finance, population displacement, and baseline economic indicators.

Data Collection Methods and Tools

The data collection strategy utilized modern, standardized, and secure digital tools to ensure efficiency, accuracy, and geo-referencing of the collected information.

Tools: Reliable digital platforms, Open Data Kit (ODK), and KoboToolbox were used to design and deploy standardized survey instruments.

- **Instrument Design:** The questionnaires were rigorously designed based on the UN-ECLAC Handbook for Disaster Assessment, the PDNA framework, and specialized guidelines from the FAO (for agriculture), the World Bank, and the UNDP (World Bank, UN, & EC, 2013; FAO, 2017).
- **Key Data Points Captured:**
 - **Description of Damaged Assets:** Type, quantity, age, and extent of damage.

- **Loss of Production/Income:** Historical and projected data points for loss calculation.
- **Additional Costs:** Documentation of related expenses incurred due to the war.

Cost Estimation and Valuation Methodology

The valuation methodology strictly adhered to the PDNA's core principles, distinguishing between damage (stock effect) and loss (flow effect) (World Bank, UN, & EC, 2013). This assessment also incorporated a detailed analysis of macroeconomic effects and a preliminary needs assessment.

Damage Assessment (Stock Effect)

Damage was defined and measured as the monetary value of destroyed or physically damaged assets (e.g., buildings, infrastructure, machinery, inventory) at the time of the event.

Valuation Method: The assessment team considered the prevailing replacement cost of the damaged properties/items in the local market.

- **Replacement Cost:** The cost of replacing the destroyed asset with a new asset of similar function and standard, including labor and transportation expenses, was used to ensure a realistic measure of the cost to restore the productive base (World Bank, UN, & EC, 2013).
- **Adjustment:** For non-market-priced goods (like public services), alternative imputation methods were used based on established valuation standards.

Loss Assessment (Flow Effect)

Loss was defined as the change in the economic flows (income, production, services) that arose as a consequence of the damage over a defined recovery period.

The estimation of total economic loss of firm output/value was predicated on a rigorous counterfactual analysis designed to quantify the difference between projected and actual economic performance. The calculation utilized a three-year pre-war baseline period (2018, 2019, and 2020) to establish the average expected path for output, revenue, or production. The final loss value was then quantified as the differential between this projected output and the actual realized output during the loss calculation period (2021, 2022, and 2023). Integral to this

total loss value is the inclusion of foregone values, which are derived from the opportunity cost principle (UN-ECLAC, 2014). This approach quantifies the unrealized economic benefits resulting from conflict-induced disruption and asset destruction, specifically encompassing foregone income and revenue from collapsed projects, lost salary and wages due to displacement or business closure, and lost savings and interest stemming from financial service interruption or appropriation. Finally, the total loss estimation incorporates additional costs, representing the direct monetary expenditures incurred by households, firms, and governmental entities for immediate operational stabilization, including rental costs for temporary facilities and the purchase costs of temporary or replacement items.

Damage severity levels, damage type, and perpetrators: Damage severity levels, typically categorized using the PDNA/UN-ECLAC framework, range from Minor Damage (covering a small loss percentage, usually [1–25%], requiring minor repairs) to Moderate Damage (involving a more significant loss, often [26–50%], necessitating substantial repairs and component replacement). This is followed by Severe Damage (representing heavy destruction, generally [51–75%] of the asset's value, demanding extensive reconstruction) and culminating in Complete Damage (where the asset is virtually destroyed, ranging from [76–100%], requiring full replacement). Furthermore, a comprehensive assessment identifies the Damage Type (e.g., destroyed, broken, burned, stolen, or missing) for specific goods and determines the respective perpetrators responsible for the damage, calculating their proportional share in the destruction.

Impact of the war

The assessment also analyzed the macroeconomic effects of the war on Tigray using variables such as employment, tax revenue, investment flow, export earnings, and income generation. The team will use the damage and loss results to estimate the recovery and reconstruction needs and suggest intervention strategies.

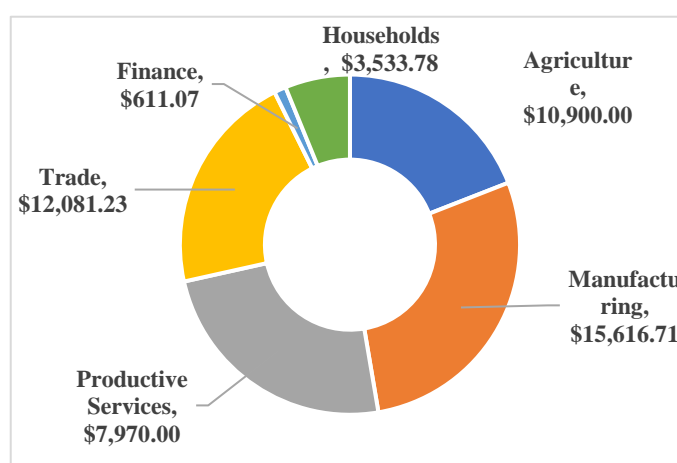
Results

Summary of Damage and Losses

The comprehensive Damage and Loss Assessment (DaLA) for the Tigray Region's Productive Sector estimates a catastrophic total economic impact of US\$ 83,840.87 million (US\$ 83.84 billion), directly caused by the war and the subsequent siege and blockage. The magnitude of this finding is fundamentally tied to the unprecedented scale and breadth of the assessment coverage, which includes 657,360 individual households and a total of 55,371 formal private firms across the productive sectors (such as trade and services), alongside the entire regional financial system (18 banks and 2 microfinance institutions). By covering the entire stock of private, public, and household assets and productive capacity, the resulting monetary values represent the full, aggregated economic destruction of the regional productive base.

The total effect is critically segmented into damage (physical destruction of assets) and loss (foregone production and income). Physical damage accounts for US\$ 33.13 billion (39.5%), while economic loss totals US\$ 50.71 billion (60.5%). This finding, where the total loss value significantly exceeds the damage value, points to an important fact: the prolonged siege and blockage, which systematically cut off banking, trade, and essential services, inflicted a more severe, systemic financial collapse on the economy than the direct physical destruction from warfare alone.

The analysis of physical damage (US\$ 33.13 billion) highlights a concentrated destruction across the region's infrastructure and private property. The services sector incurred the largest share of this destruction at US\$ 13,860.00 million (41.84% of all damage), suggesting targeted action against high-value, essential civilian infrastructure. The trade sector was the second most affected,

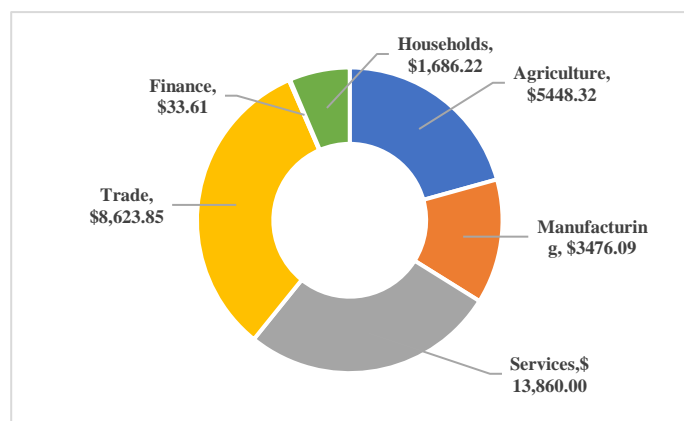


with US\$ 8,623.85 million in damage, reflecting extensive looting and demolition of commercial buildings and inventory. Critically, the Households category sustained US\$ 1,686.22 million in physical damage (5.09% of total damage). Although smaller than the damage to commercial sectors, this figure represents the direct destruction of private homes,

personal assets, and household farm tools, uniquely impacting the livelihood base of the civilian population and creating a profound displacement crisis. Agriculture (US\$ 5.45 billion) and manufacturing (US\$ 3.48 billion) also suffered substantial asset destruction, but the collective focus of the immediate physical destruction was heavily on the urban and livelihood foundations.

The most profound economic consequence is captured by the massive economic loss (US\$ 50.71 billion), which resulted from the cessation of economic flows. The manufacturing sector was the most severely crippled by these losses, accounting for the highest share at US\$ 15,616.71 million (30.79% of all losses). This is a direct measurement of productive failure resulting from the blockade's prevention of raw material and fuel inflows. Similarly, the trade sector suffered US\$ 12.08 billion in foregone revenue due to market isolation, and agriculture registered US\$ 10.90 billion in long-term losses from planting failures and lack of vital inputs.

Furthermore, the Households category recorded a direct loss of income totaling US\$ 3,533.78 million, demonstrating the devastating effect on individual purchasing power. These findings confirm that the overall economic consequence evolved from localized physical damage during the war to widespread, systemic economic strangulation during the subsequent blockade.



The strategic implications are clear: reversing the US\$ 83.84 billion impact requires immediate and targeted interventions that address the primary driver of the crisis. While asset replacement, including support for damaged households, is necessary, the recovery plan must prioritize restoring the fundamental conditions for production by urgently reopening and sustaining supply chains, telecommunications, and a fully functional financial system. These actions are essential to rapidly revive the high-loss sectors of manufacturing, trade, and agriculture and enable the productive base to generate income, creating a sustainable path toward long-term economic recovery and self-sufficiency.

Table 2A. Total Damage and Loss (US\$ Million)

Productive Sector	Damage	Share (%)	Loss	Share (%)	Total	Share (%)
Agriculture	5,448.32	16.45	10,900.00	21.49	16348.32	19.50
Manufacturing	3,476.09	10.49	15,616.71	30.79	19092.79	22.77
Services	13,860.00	41.84	7,970.00	15.72	21830.00	26.04
Trade	8,623.85	26.03	12,081.23	23.82	20705.08	24.70
Finance**	33.61	0.10	611.07	1.20	644.68	0.77
Households**	1,686.22	5.09	3,533.78	6.97	5220.00	6.23
Total	33,128.09	100.00	50,712.79	100.00	83,840.87	100.00

Source: CITG Survey, 2022 and 2023 (** represented in the 2022 survey period.)

Productive Sector and Household Livelihood Damage by Perpetrators (US\$ in Millions)

This analysis provides the definitive attribution for the US\$ 33.13 billion in physical damage inflicted upon Tigray's productive sectors and household livelihoods. The combined data goes beyond general war reports to show that the allied forces used a planned, systematic, and specialized strategy. Rather than random acts of violence, the destruction was executed through a deliberate division of labor where each major perpetrator group the Ethiopian National Defense Force (**ENDF**), the Eritrean Defense Forces (**EDF**), and the Amhara Militia Forces (**AMF**)—focused on dismantling a distinct pillar of the economy. The data confirms that the severity and mode of attack (from complete destruction to dominant looting) were precisely tailored to achieve maximum economic and social paralysis, making the damage a central strategic objective of the war.

Table 3A: Productive Sector and Household Livelihood Damage by Perpetrators (US\$ in Millions)

Perpetrators List	Trade	Agriculture	Household	Services	Manufacturing	Total Value (US\$ in millions)	Share(%)
Single Actors							
ENDF	1,253.22	382.22	813.16	8,938.34	531.41	11,918.35	36.01
EDF	1,235.11	1,813.01	549.66	1,291.18	610.37	5,499.33	16.62
AMF	2,732.05	173.85	229.95	130.89	571.82	3,838.56	11.60
IRF	0	78.88	45.02	2,603.18	95.12	2,822.20	8.53
EFP	14.14	0	24.54	531.46	572.98	1,143.12	3.45
AFF	112.75	0	10.2	364.67	127.79	615.41	1.86
Two-Party Combinations							
ENDF_EDF	705.83	301.73	0	0	718.39	1,725.95	5.22
ENDF_AMF	6.23	0	0	0	12.65	18.88	0.06
EDF_AMF / AMF_EDF	144.6	0	0	0	9.84	154.44	0.47

Perpetrators List	Trade	Agriculture	Household	Services	Manufacturing	Total Value (US\$ in millions)	Share(%)
ENDF_EFP	0.56	0	0	0	75.79	76.35	0.23
EDF_IRF (incl. IRF_EDF)	4.9	0	0	0	39.95	44.85	0.14
EFP_AMF	144.1	0	0	0	0	144.10	0.44
Multi-Party & Combined							
Combined Forces	1514.85	2,698.64	0	0	50.165	4,263.66	12.88
ENDF_EDF_AMF (3-Party)	748.3	0	0	0	3.56	751.86	2.27
Others	7.21	0	13.73	0.28	56.255	77.48	0.23
TOTAL	8,623.85	5,448.33	1,686.26	13,860.00	3,476.09	33,094.53	100.00

Note: The figure for the Finance sector represents the monetary damage value; however, the attribution of perpetrators in this sector (as analyzed in the main text) is based on the frequency of damage incidents (occurrences), not the monetary value

The single-actor part (ENDF, EDF, AMF, IRF) collectively accounts for over **72.5%** of the total physical damage, with the two primary national forces leading the destruction:

ENDF: The Destroyer of Social & State Infrastructure (35.98% Total Share) The Ethiopian National Defense Force (ENDF) is the single largest overall perpetrator, responsible for nearly 36% of all physical damage (US\$ 11.92 billion). This damage is overwhelmingly concentrated in the service sector (US\$ 8.94 billion). This pattern confirms a strategic focus on eliminating the state's functional capacity and the social backbone (health, education, utilities), reflecting actions aimed at paralyzing the region's organizational structure.

EDF: The Eritrean Defense Forces (EDF) hold the second-highest overall share (US\$ 5.51 billion). Unlike the ENDF, the EDF's damage is most concentrated in agriculture (US\$ 1.81 billion), with a secondary focus on services (US\$ 1.29 billion). This indicates a pervasive role across the rural and urban environment, specializing in the destruction of long-term productive assets like farm equipment and irrigation.

AMF: The Agent of Commercial Extraction (11.59% Total Share) The Amhara Forces (AMF) show a sharp specialization, with nearly 71% of their total attributed damage (US\$ 2.73 billion) concentrated in the trade sector. This clearly positions the AMF as the primary perpetrator in actions related to the destruction, seizure, and looting of commercial buildings and inventory, effectively dismantling the region's market wealth.

The high impact of coordinated and joint operations

The aggregated damage figures reveal the strategic importance of two- and multi-party coordination:

The Two-Party Alliance (ENDF_EDF): The combination of ENDF and EDF resulted in US\$ 1.74 billion in damage (5.24% share), heavily concentrated in Manufacturing (US\$ 718 million) and Trade (US\$ 706 million). This confirms a tactical synergy, where the two military forces aligned to destroy critical industrial and commercial targets that required larger-scale operations.

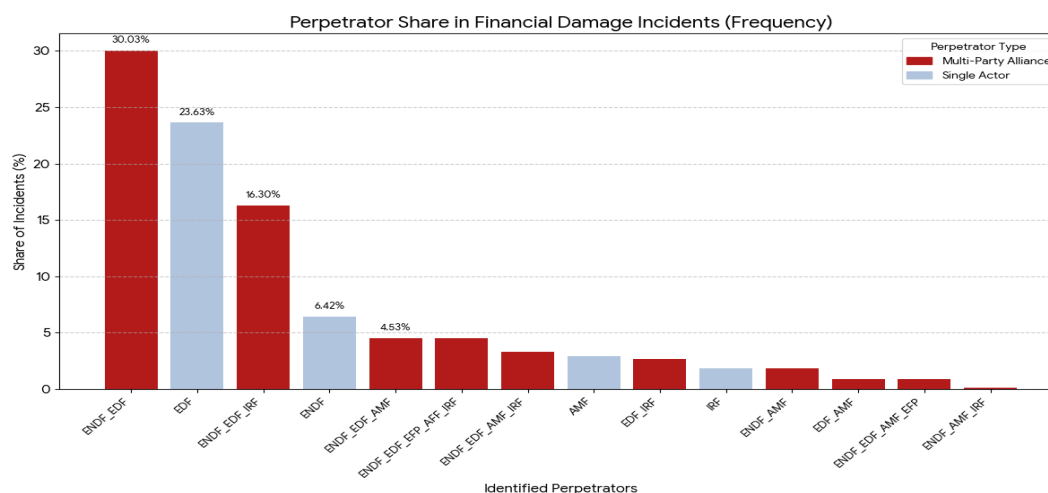
Maximal Coordination in Agriculture (8.15% Share): The largest single-cell amount outside of the three primary actors is the US\$ 2.70 billion attributed to "Combined Forces" in Agriculture. Based on the definition of involving four or more actors, this massive figure confirms that rural asset destruction was executed through large, highly coordinated joint operations. This scattershot, multi-actor approach ensured comprehensive destruction of the farming base while diffusing individual attribution.

Pervasive Civilian Damage

Despite the low overall monetary total of the household sector (US\$ 1.69 billion), the breakdown shows that over 80% of this civilian asset destruction was caused by the two major national forces: ENDF (48.22%) and EDF (32.60%). This confirms that the largest military forces operating in the region shared the primary objective of destroying civilian homes and personal property.

The data within the aggregated table reveals a calculated campaign characterized by strategic specialization: national military forces (ENDF and EDF) systematically targeted the essential social and agricultural bases of the economy, while the regional ally (AMF) focused intensely on commercial wealth and market assets. The high damage figures attributed to the combined forces further demonstrate that this destruction constituted a unified, joint strategic effort executed through varied operational structures.

Finance Sector Damage Perpetrators



As indicated in the figure above, the damage incidents in the finance sector reveal a pattern of calculated, highly coordinated systemic paralysis, demonstrating that the disabling of the financial infrastructure was a core strategic objective executed primarily through joint operations. The two-party ENDF_EDF alliance is the single largest contributor, responsible for 30.03% of all incidents, with the top three entries of which are two- or three-party coalitions (ENDF_EDF, EDF, and ENDF_EDF_IRF) collectively accounting for over 70% of the frequency of damage occurrences. This strong concentration in multi-actor involvement underscores the high operational requirement for executing successful attacks on financial targets, confirming that the sector's functional collapse was achieved through a unified military strategy rather than incidental acts by single actors, who played a relatively marginal role (e.g., ENDF at 6.42%, AMF at 2.93%).

Damage Severity in Tigray's Productive and Livelihood Sectors

The analysis of damage severity across Tigray's key economic sectors reveals a pattern of catastrophic and systemic asset destruction resulting from the war. The severity levels, ranging from minor/slight to complete/total damage, serve as a critical quantitative measure of the economic cost, indicating the depth of loss to both capital stock and immediate livelihoods. A dominant concentration of value in the highest severity category underscores the need for massive, structural reconstruction rather than simple repair.

Table 4A. Productive Sector and Household Livelihood Damage by Severity (US\$ in Millions)

Damage Severity Level	Trade	Agriculture	Services	Manufacturing	Households	Finance	Total Damage Value (US\$ Millions)	Share (%)
Complete/Total Damage	7,721.98	4,965.89	8,835.88	2,061.99	1,253.91	70.23%	24,839.65	76.73
Severe/Major Damage	779.5	139.55	595.27	110.93	188.6	3.05%	1,813.85	5.60
Moderate Damage	99.83	329.72	3,691.71	1,025.21	73.67	4.31%	5,220.14	16.13
Minor/Slight Damage	12.54	13.16	27.77	273.07	60.63	11.74%	387.17	1.20
Unspecified/Other	-	-	0.52	-	109.41	10.69%	109.93	0.34
Grand Total	8,613.85	5,448.32	13,151.15	3,471.20	1,686.22		32,370.74	100.00

Note: The Finance sector value in this table is presented as a percentage measure; consequently, the overall share calculation is derived exclusively from the remaining five sectors

Overall Productive and Household Livelihood Damage

The productive and household livelihood sectors incurred an aggregate quantified monetary damage of US\$ 32.37 billion. Compared to previous calculations, the profile of destruction is now demonstrably more concentrated in the highest severity level. Specifically, the Complete/Total Damage level now accounts for 76.73% of the total damage value, up from the previous figure of 70.43%. This increase of 6.3 percentage points in the highest severity bracket significantly heightens the conclusion that the war's primary impact was the total elimination of productive capacity and capital assets. This revised figure reinforces the interpretation that the economic crisis is fundamentally one of capital stock annihilation. Consequently, the proportionate impact of Moderate Damage is now slightly reduced to 16.13% (from 14.80%), and Minor/Slight Damage is reduced to 1.20% (from 1.10%). However, the overarching conclusion remains: the setback is profound, demanding extensive, long-term structural reconstruction.

The damage severity level for the Services and Trade sectors remains robust: they collectively absorbed over 61% of the monetary loss, signaling a devastating blow to the commercial and public infrastructure core. The services sector sustained the highest absolute damage value at US\$ 13.15 billion, with the majority categorized as complete damage (US\$ 8.84 billion). Similarly, the Trade Sector recorded a loss of US\$ 8.61 billion, with US\$ 7.72 billion of that amount classified as Complete Damage. This stability reinforces the finding that the crippling impact on essential infrastructure and commercial logistics is the single largest component of the overall economic loss.

The core interpretations for the primary and secondary sectors are also reinforced by the new overall severity: the Agriculture Sector's US\$ 5.45 billion loss, with over 91% in Complete

Damage, confirms the systematic annihilation of rural livelihoods and the creation of a protracted food security catastrophe.

The manufacturing sector's US\$ 3.47 billion loss continues to signify a severe erosion of the region's industrial base, directly impacting future employment and diversification prospects.

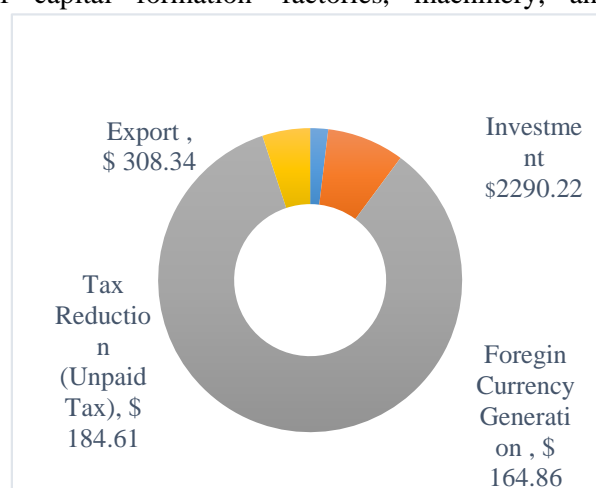
The household sector damage, totaling US\$ 1.69 billion (primarily complete damage), remains the direct quantifiable cost to civilian livelihoods and is a primary driver of the mass displacement crisis.

Finally, the finance sector's data, while presented as a percentage of functional severity, strongly contributes to the revised overall severity profile. The 70.23% concentration in complete damage within the finance sector is a key factor driving the 76.73% figure for the overall complete damage share. This high percentage in the finance sector signifies a bimodal structural failure where critical financial infrastructure was either completely destroyed or rendered non-functional, thereby serving as a fundamental constraint on the immediate capacity for commerce, wage payments, and capital mobilization necessary for economic recovery.

Impact of the war in the Productive Sector

(a) Macroeconomic and Microeconomic Impact of the war

The short-term economic shock, calculated to be approximately US\$2.95 billion and accompanied by the rendering of 368,449 employee's unemployable, represents a critical structural blow to the regional economy. The vast majority of this loss, over 77%, stems from the collapse of investment (\$2,290.22 million), leading to a severe "scarring" effect on the economy's potential GDP. The destruction and halt of capital formation—factories, machinery, and infrastructure—mean the economy is operating on a significantly and permanently lower productive frontier. Alongside this, the sharp reduction in tax collection (\$184.61 million) immediately creates an unsustainable fiscal crisis, forcing the government to incur heavy borrowing to finance crucial reconstruction efforts, thus initiating a debt overhang that will constrain public spending and crowd out private investment for years to come. Furthermore, the combined



losses in export and foreign currency generation (\$473.2 million) critically strain the balance of payments, leading to a chronic shortage of foreign exchange. This instability will fuel imported inflation by raising the cost of essential inputs, deterring foreign direct investment, and severely impeding the restart of key productive sectors like manufacturing and agriculture. Ultimately, the macroeconomic impact is not a temporary deficit but a fundamental erosion of the region's capital base, fiscal stability, and trade capacity, requiring a generation-long effort to restore the underlying drivers of growth.

Table 5A. Job Loss Rate/Unemployment

Sector	Pre-War Employment	Employment During War (2021-2022)	Job Loss (Affected Manpower)	Job Loss Rate (%)	Victims Among the Workforce (Manpower)
Manufacturing	184,144	12,078	172,066	93.44%	10,013
Trade	73,716	10,619	63,097	85.60%	4479
Agriculture	49,046	6,911	42,135	85.91%	
Services	102,962	11,811	91,151	88.53%	3657
Total	409,868	41,419	368,449	89.89%	18146

Source: CITG Survey, 2022 and 2023

The surveyed productive sectors Manufacturing, Trade, Agriculture, and Services—suffered an estimated overall job loss rate of nearly 90% (89.89%) between the pre-war period and 2021-2022, resulting in 368,449 workers losing their livelihoods. This severe loss confirms the near-total functional elimination of the formal economy, moving the crisis beyond a recession into a humanitarian and social stability catastrophe. At the sectoral level, the manufacturing

sector was the hardest hit, experiencing a devastating 93.44% job loss rate, which aligns with reports of systematic asset destruction in the industrial base. The remaining sectors, Services (88.53%), Agriculture (85.91%), and Trade (85.60%), all sustained comparable job loss rates above 85%, demonstrating that the elimination of employment was a universal outcome across all major segments of the economy.

Direct Human Cost: Victims Among the Workforce

Beyond the massive loss of employment, the workforce suffered a significant direct human toll. The figure of 18,146 victims (representing employees who were killed, injured, or went missing/lost) highlights the severe physical danger faced by workers. This direct human cost, which equates to approximately 4.92% of the total affected manpower (368,449) and 43.81% of the workforce still employed during the conflict period (41,419), underscores that the crisis was characterized not only by economic destruction but also by targeted violence against the civilian labor force. The high number of direct employee victims compounds the challenge of post-conflict recovery by eliminating experienced human capital, adding an irreparable layer of social and economic trauma to the structural unemployment crisis.

(b) Microeconomic Impact of the War in Tigray

Based on data for 657,360 household heads, the key microeconomic impacts of the war are summarized below:

Table 6A. Key Microeconomic Impacts Indicators

Impact Category	Key Indicator	Pre-War Status (Baseline)	Post-War Status (2021/2022)	Change/Severity
Damage Incidence	HHs experiencing any damage	23% were safe (Implied)	77% experienced damage	Widespread destruction of assets and security.
Forced Displacement	HHs forcefully displaced	Not displaced (Implied 39%)	61% displaced	Average duration of 274 days .
Income Loss	Total HH Income (USD)	\$2.633 Billion (2019)	\$29.68 Million (2022)	Major income decline.
Subjective Poverty	HHs considered Poor/Very Poor	Approx. 21% (2019)	Approx. 91% (2022)	Dramatic reversal of economic status.
Food Insecurity	HHs Food Secure	74.20% (2019)	18.73% (2021/2022)	81.27% became food insecure post-war.
Food Inflation (Max)	Vegetable Price Increase	Baseline (Implied)	310% increase	Massive price surges on essential food items.
Livestock Loss	Total Number of Animals	2,754,118 (2020)	983,109 (2022)	Loss of over 1.77 million animals.
Agricultural Land Loss	Arable Land Left Fallow	Negligible (Implied)	30.7% (2021/22 season)	Critical loss of productive capacity.
Unemployment Rate	HH Sector Unemployment Rate	Implied (Based on 232,100 unemployed)	74.1% (2022)	111.71% increase in unemployment.

Source: CITG Survey ,2022

The war in Tigray has had a catastrophic microeconomic impact on households, leading to the near-total collapse of livelihoods. Based on data from 657,360 household heads, the war caused

a swift and severe reversal of economic status, marked by widespread destruction and displacement, with 77% of HHs suffering asset damage and 61% being forcefully displaced for an average of 274 days. The most acute impact was the plunge into poverty, as subjective poverty surged from approximately 21% to 91%. This was directly related to a huge drop in income, with total household income falling from \$2.633 billion in 2019 to just \$29.68 million in 2022. People's ability to make a living was severely harmed: the number of households with enough food dropped from 74.20% to only 18.73%, worsened by huge price increases (like 310% for vegetables) and the loss of farming resources, including more than 1.77 million animals and The resulting unemployment rate soared to 74.1%. The total estimated damage and loss reached \$4.67 billion, with the loss value (\$2.986B) exceeding the damage value (\$1.7B), crucially demonstrating that the sustained blockage and economic inactivity were more devastating to household well-being than the direct physical destruction of assets.

(D) Impact Financial Sector Gap in Tigray

The war inflicted a complex and contradictory impact on Tigray's financial sector, showcasing remarkable community financial resilience alongside a catastrophic failure in core lending functions and profitability. This analysis compares performance before the war (June 30, 2020) and after (June 30, 2023).

Banks are showing resilience in deposits while experiencing a collapse in lending.

Banks demonstrated resilience in customer outreach and deposit mobilization but experienced a profound functional crisis in lending:

- **Outreach & Deposits:** Growth: Banks successfully opened 23 additional branches (5% increase) and saw a rise in both deposit customers (9.43%) and loan customers (12.55%). Total accumulated deposits grew by a significant 17% (US\$ 194.56 million), with annual demand deposits surging by 98%, indicating community trust and a return of liquidity post-siege.
- **Lending & Credit Risk:** Catastrophic Failure: The core function of providing credit collapsed, with the average annual loan disbursement plummeting by over 96% (a US\$ 121.28 million reduction). This freeze in lending occurred despite deposit growth, highlighting a severe capital outflow or lending constraint. The ultimate cost is reflected in the Expected Credit Loss, which skyrocketed from 0.68% to an alarming 69% of

outstanding loans (US\$ 300.85 million), reflecting the systemic destruction of borrower businesses.

- **Profitability:** Banks reported an estimated lost profit of US\$ 173.32 million and incurred over US\$ 14.22 million in additional costs.

Microfinance Institutions (MFIs): Mixed Performance

MFIs, while crucial for small enterprises, showed similar functional contradictions:

- **Outreach & Deposits:** Strong Growth: MFIs achieved a 46% growth in total accumulated deposits and an extraordinary 1,029% surge in annual demand deposits, signaling powerful grassroots resource mobilization. Outreach was stable, with branches increasing by 2.42%.
- **Lending & Credit Risk:** New lending collapsed, with Average Annual Loan Disbursement declining by nearly 95%. This functional failure, combined with deposit growth, adversely affected profitability. Consequently, Expected Credit Loss surged by 1,440%, indicating MFIs anticipate losing 22.49% of their outstanding loan portfolio.
- **Profitability:** MFIs reported an estimated lost profit of US\$ 76.78 million and incurred US\$ 6.16 million in additional costs.

In summary, both commercial banks and MFIs faced an existential crisis defined by a collapse in lending (down 95-96%) and a catastrophic surge in bad debt (up 1,440% to 11,186%), effectively paralyzing their ability to fuel post-conflict economic recovery, despite a surprising show of confidence from depositors.

Conclusion and Recommendations

Conclusion

This comprehensive Damage and Loss Assessment (DaLA) confirms that the war, siege, and blockade inflicted a catastrophic and strategically targeted economic destruction on the Tigray Regional State, totaling US\$83.84 billion. This finding is not merely a quantification of war damage but a conclusive diagnosis of systemic economic paralysis achieved through the deliberate annihilation of the region's productive capital and its capacity for self-sufficiency.

Systemic Prioritization of Economic Strangulation

The key finding is that the economic loss (US\$50.71 billion) critically outweighs the physical damage (US\$33.13 billion), establishing that the prolonged blockade was a more devastating economic weapon than direct motive warfare. The cessation of economic flows, particularly to the Manufacturing (30.79% of all loss) and Trade (23.82% of all loss) sectors, fundamentally erased the commercial and industrial base, rendering the entire region economically non-viable.

Extinction of Capital Stock and Human Capital.

The severity analysis demonstrates a crisis of capital stock annihilation, with 76.73% of the quantified damage value falling into the Complete/Total Damage category. This high figure, driven by the complete collapse of the service, trade, and finance sectors, moves the recovery imperative beyond simple repair and into a profound, decade-long structural reconstruction challenge. This is compounded by the staggering 89.89% job loss rate across all productive sectors, which constitutes an unprecedented crisis of human capital degradation and social destabilization.

Strategic and Coordinated Attribution of Destruction

The perpetrator analysis conclusively proves that the destruction was not incidental but a calculated campaign characterized by strategic specialization. The Ethiopian National Defense Force (ENDF) focused on destroying social and state infrastructure (services), the Eritrean Defense Forces (EDF) targeted long-term rural productive assets (agriculture), and the Amhara Militia Forces (AMF) specialized in the destruction and extraction of commercial wealth (trade). Furthermore, the concentration of attacks on the financial sector by multi-party coalitions underscores that the functional collapse of commerce and capital mobilization was a unified, high-priority military objective. The resulting devastation of household assets by the dominant national forces confirms that civilian livelihood destruction was an integral part of the overall strategy.

Recommendations

Based on the nature, magnitude, and strategic attribution of the damage, the recovery and reconstruction efforts must pivot from conventional post-conflict aid to a high-impact, investment-led program focused on immediately restoring the foundations of productivity and market functionality.

Immediate Policy and Logistical Intervention (Restoring Economic Flow)

Full and Unconditional Restoration of Financial and Communication Systems: The most immediate and critical priority is the full, unfettered restoration of banking, telecommunications, and energy services. Given the high loss value, economic life cannot resume until capital can flow, wages can be paid, and firms can communicate with supply chains. This must precede large-scale physical reconstruction.

Targeted Supply Chain and Trade Corridor Re-establishment: Implement a rapid, internationally monitored program to reopen and guarantee the security of key import corridors essential for the Manufacturing and Trade sectors. This is necessary to break the "economic strangulation" that caused the largest portion of the loss and prevent sustained imported inflation from chronic foreign exchange shortages.

Structural Reconstruction and Capital Recapturing

Sovereign Debt Relief and Capital Mobilization: Provided the evidence of economic capital annihilation and the subsequent fiscal crisis, the national government and international partners must initiate a dialogue on sovereign debt restructuring or relief to alleviate the projected debt overhang. This action is a prerequisite for creating the fiscal space required for public-led reconstruction investment.

Seed Capital and Credit Guarantee Fund: Establish a dedicated, multilateral Seed Capital and Credit Guarantee Fund to rapidly inject liquidity into the most damaged high-loss sectors (Manufacturing and Trade). This fund must specifically target the replacement of the \$2.29 billion loss in Investment by offering subsidized credit and risk guarantees to surviving firms and entrepreneurs, thus reversing the decline in potential GDP.

Human Capital and Livelihood Rehabilitation

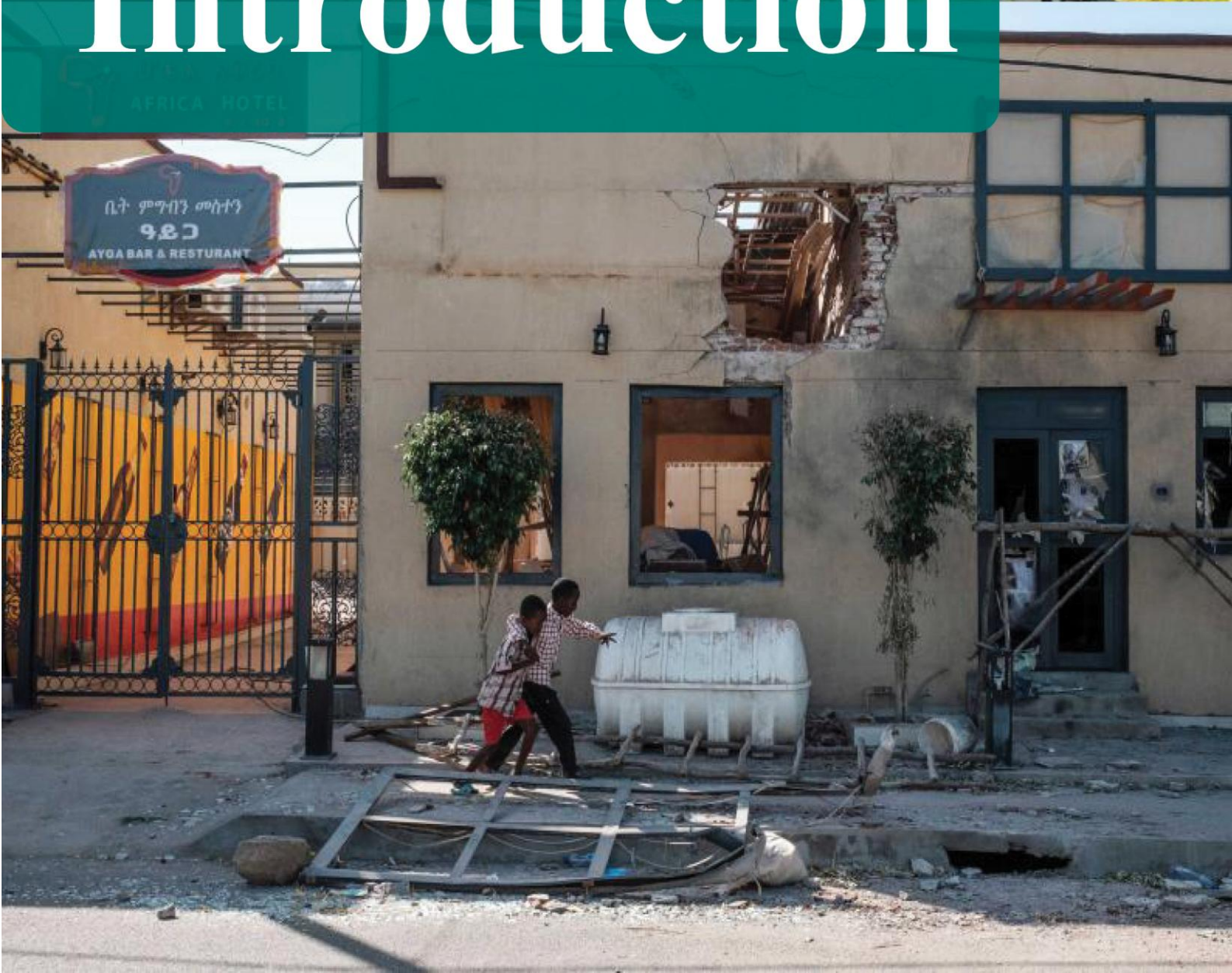
Emergency Livelihood Support for the Employable Workforce: Implement a time-bound, unconditional cash transfer program for the 368,449 unemployable workers to stabilize household income and mitigate the human capital drain. Simultaneously, launch sector-specific vocational training programs focused on construction, utility repair, and high-demand agricultural techniques to reintegrate the workforce into the reconstruction economy.

Justice-Informed Reconstruction Framework: All recovery funds must operate within a framework that acknowledges the conclusive evidence of strategic, specialized destruction by perpetrators. This is

crucial for establishing accountability, ensuring that recovery planning is equitable, and building the necessary institutional trust to secure the stability required for long-term investment.



Introduction



Chapter 1 : Introduction and Context

1.1 Introduction

1.1.1 Background

War is a terrible phenomenon that has plagued humanity since ancient times. It has caused immense pain and devastation for millions of people and their environments (Van Evera, 2001). Some of the most dreadful wars are WWII, the Yugoslav wars, the Vietnam War, the Rwandan genocide, and the Sudanese civil war (Destexhe, 1995). All triggered negative consequences on the economy, society, and environment (Serneels & Verpoorten, 2015). Human rights violations, gender-based violence, the ruin of key economic sectors, infrastructure collapse, social service disruption and environmental and natural resource degradation are some of the long-lasting consequences of these horrific wars.

Alarmingly, 60 percent of the undernourished individuals and 79 percent of the stunted children reside in countries affected by violent conflict (FAO et al., 2017). Using synthetic control methods on data from 1960 to 2000, Imai and Weinstein (2007) find that civil wars increase poverty by 12% as a result of livelihood shocks and reduce GDP per capita by 15-20% through capital destruction and investment flight. According to Goldin and Lewis (1975), the direct costs of the American Civil War were \$6.6 billion, which included \$1.05 billion in lost infrastructure in the South. This resulted in a 30 percent increase in poverty and a century-long underdevelopment of the region. According to Blattman and Miguel's (2010) meta-analysis of 50+ studies, wars double rates of food insecurity through agricultural sabotage, destroy 10–30% of tangible assets, and reduce growth by 2–2% annually.

Conflicts like civil wars, insurgencies, and intercommunal violence have increased in East Africa, undermining governance and prolonging cycles of displacement. Nearly half of the world's fragile and conflict-affected states are in the region, with violence spilling over borders and exacerbating socioeconomic disruptions, according to broader sub-Saharan trends that are greatly influenced by East African cases. The UN Security Council has emphasized how these conflicts create "new vulnerabilities" for peace and security by interacting with climate vulnerabilities (Chen et al., 2025). Since 2023, these dynamics have caused over 11.5 million people to be displaced in Sudan alone (ACSS, 2024), creating the largest displacement crisis

in history and having repercussions throughout East Africa. Similarly, more than 2.2 million people were displaced since 2020 in the Tigray region (UNHCR, 2025).

Ethiopia, located in the Horn of East Africa, has endured a long history of wars and internal turmoil, with the northern Tigray region often serving as a primary battlefield—from ancient Aksumite-era conflicts and resistance to Italian colonial invasions (1895–1896 and 1935–1941) to modern civil strife. The Ethiopian Civil War (1974–1991), a 17-year multi-front insurgency against the Derg military regime (1974–1987, formally the Provisional Military Government of Socialist Ethiopia), culminated in victory for the Ethiopian People's Revolutionary Democratic Front (EPRDF), a coalition dominated by the Tigray People's Liberation Front (TPLF). Founded in 1975, the TPLF led Tigray-based guerrilla operations with significant local support, contributing decisively to the Derg's overthrow in May 1991. This paved the way for a transitional government in July 1991, which introduced Ethiopia's ethnic federal system under the 1995 Constitution (Abbink, 1998; Tronvoll, 2009).

After the first election (1995?), the Ethiopian People's Democratic Front (EPRDF) won most seats and then ruled Ethiopia for 27 years. During this period, Ethiopia achieved remarkable economic progress with double-digit growth for over two decades. The poverty rate in the country declined sharply from 45% in 1995 to 24% in 2016 (World Bank, 2020). Although Tigray did not benefit much from this progress, poverty declined from 61% in 2000 to 29.6% in 2018 (BoPF, 2018b), but still higher than the national average. Moreover, life expectancy in Tigray increased from 47 years in 1991 to 66 years in 2018, though is lower than the national average of 68 years (World Bank, 2020). The economy in Tigray grew at an average annual rate of between 9 and 11% since 2003 (BoPF, 2020) until it dropped to 8.88% in 2015 and to 6.79% in 2019, which is also much lower than the national average of 12% between 2004 and 2018 (World Bank, 2020).

Despite substantial economic advancements under the Ethiopian People's Revolutionary Democratic Front (EPRDF) coalition, with real GDP growth averaging 10.3% annually from 2005/06 to 2015/16 (World Bank, 2020), this period of stability was progressively undermined by large-scale public protests beginning in 2015. The unrest stemmed from entrenched structural problems, including youth unemployment rates exceeding 25% in urban areas, a Gini coefficient rising from 0.30 in 2011 to 0.35 in 2016 indicating growing income inequality and credible reports of systemic corruptions by security forces (Mohamed et al., 2018). This escalating crisis led to the resignation of Prime Minister Hailemariam Desalegn and the appointment of Abiy Ahmed as Prime Minister on April 2, 2018. Upon taking office, Abiy's

administration launched comprehensive reforms, including the release of thousands of political prisoners to promote national reconciliation, the signing of the Joint Declaration of Peace and Friendship with Eritrea on July 9, 2018, ending a two-decade conflict, and proposals to reduce the autonomy of ethnic-based regional states in favor of centralized authority (Oxford Analytica, 2018; ICG, 2019).

However, Abiy Ahmed's centralizing reforms, including the merger of EPRDF constituent parties into a unitary Prosperity Party (PP) in December 2019, side-lined the Tigray People's Liberation Front (TPLF), which refused to join and was effectively marginalized from national power structures (Jima, 2023; ICG, 2019). The TPLF strongly opposed these changes, framing them as an unconstitutional assault on Ethiopia's ethnic federal system, a deliberate dismantling of regional self-rule guaranteed under Article 39 of the 1995 Constitution, and a direct betrayal of the political settlement that had sustained the EPRDF coalition since 1991 (Jima, 2023; Fiseha, 2024). This irreconcilable ideological and political divide—intensified by escalating ethnic mobilization and mutual accusations of authoritarianism—culminated in the formal dissolution of the EPRDF in December 2019 and the formation of two rival political entities: the TPLF, retaining control in Tigray Region, and the Prosperity Party, dominating the federal government and all other regional states except Tigray (ICG, 2019; Jimma, 2023).

In order to weaken the TPLF-led regional government and its people before and during the start of armed conflict in November 2020, the federal government imposed a series of punitive economic measures on the Tigray region. Tigrayan officials and international observers referred to these measures as an "economic war" or de facto blockade, which significantly increased political tension (ICG, 2020; Welesilassie and Gerencheal 2025). These actions included the suspension of federal development projects worth more than \$100 million a year, such as road construction and irrigation projects; the effective blockage of important highway routes connecting Addis Ababa with Mekelle through Woldia route, which hindered the flow of people and goods for months; the withholding of roughly 20 billion birr (roughly \$380 million) in federal budget allocations and safety net funds starting in September 2020; and severe restrictions on essential services, such as access to banking and credit through the Commercial Bank of Ethiopia, hard currency for imports, and federal travel permits, leaving thousands of Tigrayans overseas (ICG, 2020; ReliefWeb, 2021). The House of Federation defended these as a reaction to Tigray's "illegal" regional elections, but the Tigray regional government deemed them constitutional.

Additionally, federal forces confiscated a \$1.02 million surveillance drone in October 2020 that the Tigrayan diaspora had purchased through crowdfunding for desert locust control operations during the 2020 cropping season. This crisis had already threatened to destroy up to 200,000 hectares of Tigrayan farmland, leaving the region vulnerable to unchecked swarms and amplifying the risks of food insecurity amid the ongoing locust invasion (ICG, 2020).

The dispute escalated to a constitutional crisis when the TPLF-led Tigray regional government held unilateral elections on September 9, 2020, rejecting the federal parliament's COVID-19-related postponement of national polls originally scheduled for August 2020 (ICG, 2020). The federal House of Federation declared the vote unconstitutional on October 7, 2020, while the Tigray administration insisted that the federal term had legally expired on October 5, 2020, per Article 105 of the Constitution (ICG, 2020). Tensions were further inflamed by Ethiopia's deepening military alignment with Eritrea, formalized through joint exercises and intelligence sharing since 2018 (Gebrewahd et al., 2024). This shift culminated in Eritrean President Isaias Afwerki's public declaration on October 28, 2020, stating "Game over for the TPLF," signaling Eritrea's intent to support a decisive federal campaign to dismantle the TPLF's political and military power (IDN TIMES, 2021; Gebrewahd et al., 2024; Melicherova et al., 2024).

On November 4, 2020, the Ethiopian federal government, in alliance with Amhara regional militias and invited Eritrean Defense Forces—along with reports of Somali troops trained in Eritrea and deployed to support the offensive—launched a full-scale invasion of the Tigray region, targeting the Tigray People's Liberation Front (TPLF) in what rapidly escalated into a brutal two-year war marked by widespread atrocities (Gebrewahd, 2019; Tronvoll, 2022; Blanchard, 2021; Walsh & Dahir, 2022; Plaut & Vaughan, 2023). This devastating conflict inflicted immense material destruction, including the shelling and looting of hospitals, schools, and infrastructure; human losses estimated at 162,000 to 600,000 deaths from direct violence, famine, and lack of medical access; profound psychological trauma, with survivors reporting mass trauma from ethnic targeting; environmental degradation through scorched-earth tactics and disrupted agriculture amid locust invasions; and social fragmentation via forced separations of families and communities (Plaut, 2023; Plaut & Vaughan, 2023; Tefera, 2024).

The Tigray war, erupting on November 4, 2020, coincided with the critical harvest season in a region where 6.2 million people—over 90% of the population—urgently required food assistance, while the World Food Programme (WFP) provided nutritionally fortified supplementary feeding to approximately 1.2 million women and children to combat acute

malnutrition (WFP, 2021). The conflict inflicted catastrophic agricultural and economic devastation, with satellite imagery and field assessments confirming the destruction or looting of over 90% of the 2020 meher harvest and approximately 80% of livestock across accessible areas, severely undermining the livelihoods of more than 1 million farming households (United Nations Office for the Coordination of Humanitarian Affairs, 2021; FAO, 2021).

Concurrently, widespread dismantling and destruction of private businesses, factories, and industrial infrastructure—such as the Almeda Textile Factory and over 1,200 small and medium enterprises—resulted in mass unemployment, leaving millions without income and contributing to a near-total collapse of the regional economy (World Bank, 2023). The violence and resulting insecurity also triggered a major refugee crisis, with over 70,000 Tigrayans, primarily women and children, fleeing across the border into eastern Sudan by early 2021, overwhelming reception centers and requiring sustained international humanitarian support (United Nations High Commissioner for Refugees, 2021)

The humanitarian crisis in Tigray intensified dramatically following the Tigrayan forces' recapture of the regional capital, Mekelle, on June 28, 2021, which prompted the Ethiopian federal government to impose a comprehensive "360-degree siege" or de facto blockade, severing access to essential services including banking, fuel supplies, medical aid, commercial flights, land transportation, and consumer goods, thereby exacerbating daily fatalities from starvation, untreated illnesses, and mobility restrictions (United Nations, 2021). A World Health Organization director characterized the ensuing conditions as "very horrific," underscoring the rampant hunger, collapsed health infrastructure, and widespread sexual violence that left millions isolated and vulnerable.

This blockade contributed to the forced displacement of approximately 3.1 million individuals—comprising over 2 million internal displacements within Ethiopia and more than 70,000 refugees fleeing to Sudan—while the overall conflict has resulted in an estimated 162,000 to 378,000 deaths, predominantly civilians, due to direct violence, famine, and healthcare denial (Plaut, 2023; United Nations High Commissioner for Refugees, 2021). Economically, the war has inflicted a staggering \$22.7 billion in losses to Tigray's infrastructure, agriculture, industries, and livelihoods, equivalent to roughly 5% of Ethiopia's national GDP and hindering any prospects for swift recovery (Hasanah et al. 2023; Sidiq & Sagena, 2025; BMJ Global Health, 2021).

The Tigray war inflicted near-total devastation on public infrastructure, rendering financial institutions—such as banks and microfinance outlets—largely inoperable due to looting and physical damage, while social sectors including health and education facilities, irrigation systems supporting over 64,000 hectares of farmland, water supply networks (with coverage plummeting by more than 50% to just 25-28% in urban and rural areas), roads spanning thousands of kilometers, and vehicles essential for transport were systematically destroyed or vandalized, reducing them to non-functional status across the region (Shishaye et al., 2023; WFP, 2021). Approximately 2.4 million school-aged children were denied access to education for up to three years, with 85% of schools severely or partially damaged and 78% rendered non-operational due to occupation by displaced persons, destruction, and lack of resources, while the health system fared even worse, with around 88% of facilities shuttered, looted, or inaccessible amid shortages of medicines, power, and staff, leaving only 17-22% partially functional (WFP, 2021; Gesesew et al., 2021).

The federal government's comprehensive bans on inland and air transport—enforced through checkpoints, sieges, and airspace restrictions—froze the flow of goods and services, halting commercial flights and truck convoys for months and exacerbating a humanitarian blockade that left millions isolated without essentials (ICG, 2020). This isolation triggered skyrocketing prices for basic commodities, with food and fuel costs surging up to 200-300% in a hyperinflationary spiral driven by scarcity and black-market dynamics, transforming Tigray's economy into a precarious, informal marketplace rife with hoarding, speculation, and rampant disinformation that eroded trust and amplified daily survival struggles amid fear and uncertainty (Cascais, 2025; NATO Association of Canada, 2021).

The purpose of this assessment is to conduct a Damage and Loss Assessment (DaLA) of the war in the Tigray region. It employs a comprehensive and multidimensional approach that examines direct and indirect economic damage and loss, assesses the severity of the damage, and identifies the perpetrators responsible for the damage.

1.1.2 Objective of the study

The primary objective of this Damage and Loss Assessment (DaLA) is to systematically examine and quantify the extent, characteristics, and financial valuation of damages and losses affecting productive sectors in Tigray, while evaluating the broader impacts stemming from the war, siege, and blockade.

The specific objectives of the DaLA are to:

1. **Assess Damage Severity:** Evaluate the magnitude and intensity of physical and structural destruction to assets, encompassing residential buildings, offices, laboratories, personal belongings, and critical infrastructure, resulting from the conflict.
2. **Quantify Damage Value:** Accurately determine the monetary value of destroyed or impaired assets and infrastructure within the economic and productive sectors attributable to the war.
3. **Estimate Loss Value:** Rigorously compute the total financial losses, including forgone income from disrupted production or elevated production costs, revenue shortfalls due to interrupted service delivery, and other war-related additional losses in the productive sectors.
4. **Analyze Economic Impacts:** Examine the short-term economic repercussions of the war on rural farming households, incorporating reductions in agricultural output, livestock depletion, and damage to farm infrastructure, as well as effects on tax revenues, foreign direct investment inflows, exports, inflation, unemployment, food insecurity, and poverty levels.
5. **Build Evidence for Accountability:** Record and scrutinize the nature, extent, and modalities of inflicted damages and losses to produce compelling evidence supporting future accountability and justice processes.
6. **Develop a Scientific Baseline:** Methodically document and archive the complete DaLA results to create a reliable historical record for use by future generations, scholars, and decision-makers.
7. **Guide Recovery and Reconstruction:** Leverage the damage and loss evaluations to formulate a solid financial foundation for crafting a comprehensive Recovery and Reconstruction Framework tailored to Tigray's productive sectors.

1.1.3 Scope of the Study

This assessment is defined by clear temporal, geographical, and sectoral boundaries to provide a focused basis for recovery, rehabilitation, and reconstruction planning.

Temporal Scope

The assessment covers the period commencing November 2020. However, the cut-off date for data collection varies by unit of analysis:

- **Household Census (Livelihood Damage):** Data collection spans from November 2020, to August 2022. Damages and losses sustained during the renewed phase of the war (from late August 2022 until the Pretoria Agreement) are explicitly excluded.
- **Sectoral Assessment (Public and Private Infrastructure):** Data collection covers a slightly longer period, running from November 2020, to December 2023.

Geographical Coverage

The assessment focused on areas accessible at the time of data collection (2022-2023) and primarily under the administrative control of the Tigray Government:

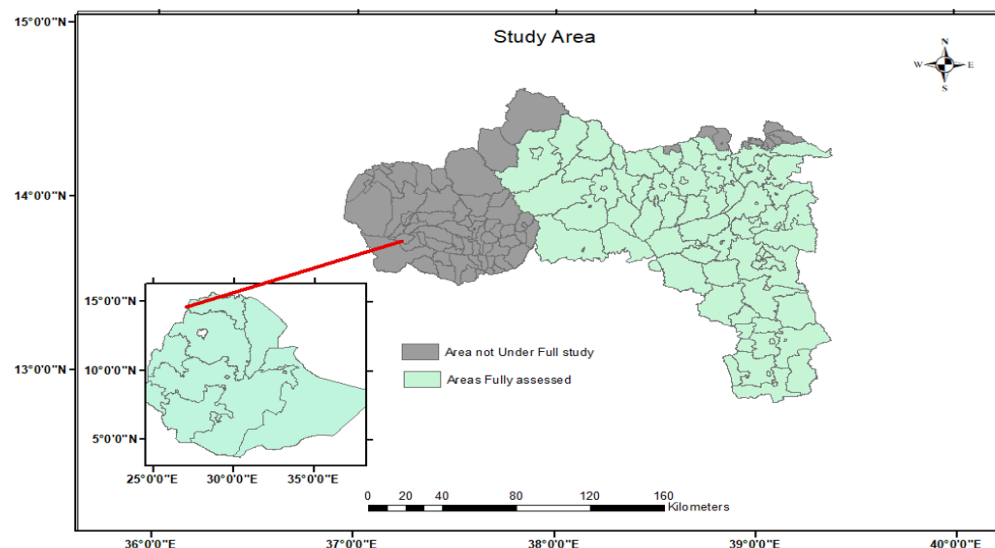


Figure 1. Geographical Scope of DaLA Assessment

The map shows the assessment successfully collected data from six out of seven administrative zones in Tigray.

Inclusions and Exclusions¹

The assessment adheres strictly to civilian material, economic, and social damage and losses, in line with standard Damage and Loss Assessment (DaLA) methodologies. The primary units of analysis encompass all households, community representatives, private-sector firms, and public institutions within the surveyed areas, regardless of ethnicity. Owing to security constraints, the Western zone and select inaccessible woredas in the Eastern, North-western, and Southern zones were excluded from the primary survey.

Internally Displaced Persons (IDPs): To address this limitation, the assessment team integrated partial data gathered from IDP centers within the surveyed zones, thereby partially capturing reported economic losses among displaced populations. However, a comprehensive damage and loss assessment for IDPs remains pending and constitutes a primary task for the inquiry commission.

1.1.4 Structure of the report

This report has four main sections: a Methodology explaining the study design, data collection, analysis, and limitations; and six chapters on sector-specific findings. These include Damage and Loss to the Household Sector, assessing impacts on residential buildings, equipment, and assets, and their effects on livelihoods. The Agriculture chapter covers impacts on assets, infrastructure, and disruptions to production and markets. Manufacturing examines effects on machinery, tools, and operational disruptions. The Service sector discusses losses from service interruptions and asset damage. The Trade chapter analyzes trade disruptions and infrastructure damage affecting market access and supply chains. The Financial sector summarizes asset damage and financial losses from systemic disruptions of the financial system. Together, these chapters offer a comprehensive overview of the study's findings.

¹ Military Damage: Military damaged assets and personnel casualties are excluded from this survey
Compensation Costs: Estimates for compensation or future liability costs are not addressed.

1.2 Methodology

1.2.1 The Damage and Loss Assessment (DaLA) Framework

This assessment aims to assess the damage and loss caused by the war in Tigray region, so as to estimate the recovery and reconstruction needs for restoring the pre-war conditions and enhancing the resilience of the affected population. The study adopts the Damage and Loss Assessment (DaLA) methodology, which is a standard tool developed by the UN Economic Commission for Latin America and the Caribbean (UN-ECLAC) and widely used by various international organizations, such as the World Bank, the UN, and the European Commission. The DaLA methodology provides a systematic and comprehensive approach for estimating the direct and indirect effects of disasters on the physical, economic, social, and environmental assets and activities of a country or a region, as well as for identifying and prioritizing the recovery and reconstruction needs based on the damage and loss estimates. The study also adopts the Sendai Framework's format for data collection instruments and reporting formats (Aitsi-Selmi et al., 2015; UNISDR, 2016, 2017).

The assessment adopts a sector-by-sector approach, encompassing all sectors impacted by the conflict in the region. For analytical purposes, the productive economic sector is categorized into six distinct sub-sectors: (1) Agriculture, (2) Manufacturing, (3) Trade, (4) Productive Services, (5) Finance and Banking, and (6) Households. Each sub-sector utilizes a specific methodology (where required) for estimating damage and loss, basing calculations on available data sources, standard valuation methods, defined indicators, and established assumptions.

The assessment also evaluates the overall effects of the war on the macroeconomic performance of the Tigray region, with special reference to employment, tax revenue, investment flow, export earnings, foreign currency reserves, income generation, and loan repayment. The assessment compares the macroeconomic indicators of the Tigray region before and after the war to assess the magnitude and direction of the changes. The study also analyzes the potential risks and uncertainties that could affect the macroeconomic outlook of the Tigray region in the post-war period. The assessment provides policy recommendations and suggestions to mitigate the negative impacts of the war and to foster economic recovery and resilience in the Tigray region.

In establishing the scope of valuation, goods were categorized into two classes: Market-Priced Goods (e.g., vehicles, buildings, machinery, and spare parts), which formed the exclusive focus

for monetary damage estimation, and Non-Market-Priced Goods (e.g., heritage sites, ecosystems, and cultural assets), which were noted but excluded from monetary valuation in this report.

Baseline is general and sector-specific pre-war data and information collected for comparison with the post-war scenario or conditions (presented in “physical numbers. The framework gives the possibility to use three methods of calculating baseline using a strategic plan, a simple time series auto regressive forecast and average values of pre-disaster three years. The economic team had an interest in using the strategic plan and forecasting method in order to project the value of 2020, 2021 and 2022 years. However, there have been missing data records for every sector. In this case, we used the average value of three pre-war years (2017, 2019 and 2020) as a baseline and predicted the value of 2020, 2021 and 2022 and calculated the production loss in the case of agriculture and manufacturing sector and revenue, sales and bill sales loss in the case of service, trade and manufacturing sector

Damage is defined as a full or partial material destruction of physical assets in the affected area. Damage incurred as a result of the war is measured in physical units. Damage specifically includes destroyed, broken, burned, stolen and missing office furniture, buildings, vehicles, electronics, infrastructure, machinery, spare parts, kitchen tools and farm tools etc. Following this, a damage type (i.e., destroyed, broken, burned, stolen and missing) and damage severity composed of four scales (1-25%, 26-50%, 51-75% & 76-100%) were specified for every damaged item. This assessment was accompanied by a technical crew composed of economists and civil or mechanical engineers who are responsible for the valuation of damage of buildings, machinery and vehicles. In the case of building damage, the technical crew measures the type, severity and amount of damage. The value of replacement cost for a damaged building is determined based on the unit cost set by the Bureau of Construction and City Development revised every three months.

Loss in the commission is defined as a temporary change in the economic flows arising from the war. Losses covers a time from the time of the destruction until the time of economic recovery or compensation. Loss means the interruption or decline in production and productivity or increasing cost of production in the case of productive or economic sectors like Agriculture, industry, trade and tourism. Likewise, it is the interruption of service decline in revenue, or increasing cost of service operation in the case of service sectors such as education and health (Jovel & Mudahar, 2010). Loss in this assessment also includes additional costs of

repair or maintenance in post-war, rental costs, purchase of new goods to replace the damaged item using adjusted net additional price² and unexpected expenditures to meet emergency needs. On top of this, the loss section further includes the forgone values of any program, project and contract that would earn an economic benefit had not been a war in Tigray or simply in the absence of war in Tigray region. The monetary value of losses is expressed in current values (Jovel & Mudahar, 2010).

1.2.2 Target Population and Enumeration Coverage

The region of Tigray suffered enormous losses to its economy, society, and environment due to the war and siege. Famine (Awange, 2022), inflation (Abay and Demissie, 2022), and isolation (Nyssen et al., 2022; Weldemichel, 2022) affected millions of people. A census was necessary to evaluate the damage and the compensation demands of the households, private firms, and public institutions that were impacted.

We had several reasons for choosing a census over a sample. First, we aimed to capture the variety and intricacy of the damage and the compensation needs of each unit in the population, as we presumed that they were not uniform or estimable from a subset of the population. Second, we sought to provide more detailed information about small sub-groups within the population, such as those residing in remote areas, those belonging to ethnic minorities, or those experiencing extreme hardship. This would enable us to identify and address their specific needs and challenges. Third, we intended to provide benchmark data for future studies, as a census would give us a true measure of the population without sampling error.

This would assist us in monitoring the progress and impact of the recovery and reconstruction efforts over time. Fourth, we desired to increase the credibility and legitimacy of the data collection process, as a census would involve the participation and consultation of all units in the population. This would help us to build trust and confidence among the stakeholders during intervention in the rehabilitation and rebuilding process. We recognize that a census may have some disadvantages, such as higher cost, longer time, and greater chance of errors, as compared to a sample. The advantages of a census in our context outweigh the disadvantages.

The war in Tigray, coupled with an imposed blockade, inflicted profound economic, social, and material devastation across the region. The blockade, more than the direct conflict,

² The net price is price calculated by the price of any item or good minus the price of the same or similar good based on consumer price Index in Addis Ababa during the full siege years, 2020, 2021.

triggered an artificially induced famine and widespread starvation, bringing household and economic activities to a standstill. Tigray's economy collapsed entirely, halting all economic activity until the Pretoria Agreement was initiated. This catastrophic disruption resulted in a significant loss of economic value in Tigray compared to other regions within Ethiopia and globally.

To comprehensively assess the extent of the damage, loss, and needs in Tigray, a full census was currently mandatory, targeting data collection from every individual, household, private enterprise, and public institution. Initially planned to survey approximately 1.27 million household heads, the census has reached nearly 1 million. However, due to technical issues with the mobile data collection application, cleaned and labelled data is available for only 657,360 households. Consequently, the current analysis of damage, loss, and needs is based on data from 657,360 household heads, representing 52% of the target population. Additionally, the assessment targeted the inclusion of approximately 160,000 private firms, 64 regional institutions, and 21 federal institutions. However, the commission ultimately covered about 37.5% of the private firms and 95% of the regional institutions.

1.2.3 Data Sources and Survey Tools

The assessment adopted a robust data collection framework that integrated primary census data with secondary sources to rigorously quantify the scale of physical damage and economic losses, while enabling a nuanced analysis of the war's socio-economic repercussions.

Pre- and Post-Conflict Census Data

Primary data, derived directly from field-based structured questionnaires and systematic observations, served as the foundational evidence for precise damage and loss estimations, ensuring empirical reliability and minimizing reliance on extrapolated assumptions. This core dataset was generated through exhaustive censuses targeting three critical units, which collectively captured the multifaceted impacts across civilian, private, and public spheres.

At the household level, a comprehensive enumeration was conducted to document civilian-level destruction, encompassing livelihood disruptions, agricultural losses (including crops and livestock), property damage, and forgone income. Originally designed to survey approximately 1.27 million household heads, the census achieved coverage of nearly 1 million, providing a statistically representative sample that strengthens the validity of loss calculations and mitigates sampling biases inherent in smaller-scale surveys.

For private enterprises, data were systematically collected from firms across key productive sub-sectors—agriculture, productive services, manufacturing, trade, and finance—to evaluate operational interruptions, asset depreciation, and disruptions to economic flows. Targeting around 160,000 firms, this component yielded granular insights into private-sector resilience and recovery needs, essential for evidence-based policy formulation in post-conflict reconstruction.

Finally, public institutions were surveyed, including service providers in health, education, and utilities, alongside specialized government bureaus (e.g., Bureau of Agriculture, Bureau of Industry, Bureau of Trade and Exports, and the Investment Commission). This effort, encompassing approximately 64 regional and 21 federal entities, quantified infrastructure damage and service delivery shortfalls, offering a critical lens on governmental capacity erosion and its broader implications for societal stability

Secondary Source Data

Complementing the primary census, secondary data were drawn from pre-war economic projections, official administrative records from pertinent government bureaus, humanitarian partner reports, and peer-reviewed academic literature. These sources were indispensable for constructing a reliable pre-conflict baseline, against which post-war deviations could be measured with greater accuracy, thereby enhancing the overall credibility of impact assessments. By cross-validating primary figures against these established references, the methodology addressed potential reporting errors or biases in field data—such as over- or under-estimation due to respondent recall or access constraints—while providing contextual depth to interpret war-induced changes. This triangulation not only fortified the analytical rigor but also facilitated comparative analyses with similar conflict scenarios, underscoring the assessment's utility for informed, equitable resource allocation in recovery efforts.

Data Collection Methods and Tools

The assessment used survey tools to collect data from different sources: These are structured questionnaires that were administered to collect data from household heads, Private sectors, and public institutions. These are one-to-one conversations that were conducted after developing open and closed questionnaires. The conversations were with each household head, private enterprises, and public institutions. Based on the nature of the institutions, on the top of secondary data sources, different data collection tools were developed and utilized.

The survey was conducted in person using well-trained enumerators (35,000 for household and 3000 for enterprises) and supervisors (6,000 for household and 650 for enterprise surveys). The interview aimed to collect quantitative and qualitative data on the damage and loss caused by the war. For this purpose, six types of data collection tools (household livelihood interviews, agriculture, manufacturing, productive service, trade and finance for enterprise interviews) were developed and utilized.

Moreover, case studies that are in-depth and comprehensive analyses of specific cases or examples that illustrate the war impacts, especially on productive service, Manufacturing, and Agriculture sectors, were also adopted for further and detailed information. The case studies were based on multiple sources of evidence, such as documents, reports, records, observations, interviews, etc. The case studies aim to collect contextual and holistic data on the consequences of the war in different sectors and dimensions.

1.2.4 Damage, Loss, and Impact Valuation Methods

Damage and Loss Valuation Method

Damage and Loss Estimation Framework: The assessment utilizes the internationally recognized Damage and Loss Assessment (DaLA) methodology, which aligns with the core principles outlined in the Post-Disaster Needs Assessment (PDNA) framework established by the GFDRR (Adekola & Adekola, 2024; Kueny et al., 2025). This comprehensive approach estimates the effects of the conflict across the affected region, covering both direct physical Damage to assets and indirect economic Losses arising from the disruption of economic flows and services. The DaLA process broadly guides the assessment through stages that include gathering baseline data, assessing effects in monetary terms (based on pre-disaster replacement or repair costs), evaluating post-conflict socio-economic impacts, identifying recovery needs, and developing sector-specific recovery plans.

To quantify this, each damaged asset was assigned a damage type (such as destroyed, burned, or stolen) and a classified severity score (mild, average, medium, or severe). Conversely, Loss refers to the temporary changes in economic flows and services that are a consequence of the war and siege, spanning the period from asset destruction until economic recovery. This includes interruption or decline in production across productive sectors (Agriculture, Industry, Trade), decline in revenue or increased operational costs in service sectors, and additional costs such as post-war maintenance, rental expenses, and expenditures to meet emergency

requirements. Crucially, the calculation of loss also incorporates Forgone Values, such as lost income from forgone savings, contracts, projects, and estimated labor income.

Baseline Calculation and Valuation Approaches: Establishing a reliable Baseline, the expected pre-war conditions were critical for calculating production losses. While the team initially intended to use Strategic Plan targets or Time Series Autoregressive Forecasting, widespread missing data for the conflict years (2021-2023) necessitated the adoption of an alternative approach. The primary baseline for loss calculation was established using the average values of three pre-war years (2018, 2019, and 2020). Loss values for 2021 and 2022 were then determined by subtracting the actual recorded figures from this three-year average, with the 2023 loss value being a projection adjusted for an average inflation rate of 33%. The monetary valuation of damage utilized three primary approaches, often supported by technical expertise from engineers and economists:

Gross Replacement Cost was used for the complete destruction of market-priced goods (valued using pre-war prevailing price information of 2020); Rehabilitation/Repair Cost was applied to estimate the repair costs of partially damaged assets; and the Opportunity Cost method or shadow wage approach (Gammage, 2010) was employed to calculate the value of forgone economic benefits, including lost household labor income. Furthermore, Imputation was used to make educated estimates for non-standard assets or when market prices were infeasible, and the Value-Added Approach (Fellows & Dobson, 2017) was considered for specific agricultural production losses.

Sector-Specific Valuation Methods: To ensure accuracy and compliance with International Valuation Standards (Aronsohn, 2017), specialized methods were deployed across key sectors. For Buildings in urban areas, valuations were based on unit costs set by the Bureau of Construction, validated by averaging unit prices collected externally from three contractors during the assessment period. In the Financial Institutions (Banks and MFIs) sector, the team primarily relied on replacement costs reported by the institutions themselves, resorting to imputation from comparable companies only where data was undisclosed. Finally, losses in agricultural and manufacturing production were estimated using local and up-to-date producer's gate prices to reflect current market realities.

The assessment reveals that losses in Tigray far exceed damages, primarily due to the unique methodology employed in the census. Four key factors explain the elevated loss values. First, the estimation of losses accounts not only for material damages but also for the severe

disruptions caused by the complete siege during the war. The blockade led to critical shortages of essential supplies, including inputs, raw materials, cash, electricity, transportation, fuel, and banking services, necessitating a comprehensive accounting of these impacts.

Second, the siege-induced inflation significantly inflated loss estimates. In February 2022, Ethiopia's food inflation reached 41.9%, up from 39.9% the previous month, while non-food inflation dropped to 22.9% from 27.3% in January (Abay and Demissie, 2022). In Tigray, however, consumer goods prices, particularly for food and medical supplies, tripled, with regional inflation rates exceeding three times the national average. As losses are calculated based on current price values, this hyperinflation significantly elevated loss estimates compared to neighbouring regions.

Third, Tigray's geographic distance from Ethiopia's capital exacerbates the high loss values. Increased transportation costs, driven by the region's remoteness, have led to higher prices for goods and services, further inflating loss estimates. Finally, unlike assessments in other regions, which primarily relied on satellite-based tools and aggregated public sector data, Tigray's census employed a survey-based approach, collecting disaggregated data from individual households and private businesses. This method typically yields higher loss estimates compared to satellite-based assessments, as it captures granular, household-level impacts.

Economic Impact of the Conflict

Previous assessment reports highlight a range of impact scenarios that typically emerge following a disaster (ECLAC, 1991; Zapata & Madrigal, 2009). A key consideration in this context is the differentiation of disaster effects based on the magnitude of immediate versus long-term consequences across economic, social, spatial, and demographic dimensions, as well as the scale and resilience of the affected economies at the time of the event. Earlier reports conclude that disaster vulnerability persists in all impacted regions even after reconstruction begins; however, this condition is particularly acute and pronounced in less economically developed countries. Disasters pose a significant challenge to the region's sustainable development, particularly in efforts to alleviate extreme poverty (UNDP, 2004).

The war in Tigray (2020–2022) has inflicted profound human, economic, social, and psychological impacts, manifesting across multiple dimensions of human development and poverty. The region endured a comprehensive "360-degree siege," involving blockades on humanitarian aid, telecommunications, and essential supplies (International Crisis Group,

2021). For instance, it has been estimated that over 90% of the harvest was lost due to widespread looting, burning, or other forms of destruction, while approximately 80% of the region's livestock was looted or slaughtered (World Peace Foundation; 2021). The full blockage hampered economic activities and restricted humanitarian access, resulting in 70% of the population experiencing starvation, high levels of acute food insecurity, and excessive mortality (Plaut, 2021).

These agricultural devastations contributed to the internal and external displacement of 2.2 million individuals—equivalent to over half the region's pre-war population (UNOCHA, 2022). Direct human losses from combat, massacres, and related violence are estimated at 162,000 to 378,000, encompassing both immediate fatalities and indirect deaths from starvation and lack of medical care (Plaut, 2023; United Nations High Commissioner for Refugees, 2021). Furthermore, internationally documented material damages, including destruction to infrastructure, homes, and industries, total approximately \$22.7 billion (Hasanah et al. 2023; Sidiq & Sagena, 2025).

To assess the conflict's impact across multiple levels—households, business groups, and the region overall—we collected data on key macroeconomic indicators, including pre- and post-war employment, income generation, tax contributions, export volumes, investment trends, outstanding loans, foreign currency earnings, and unpaid wages. We also gathered microeconomic indicators such as fertility rates, poverty rates, food insecurity indices, displacement figures, crop production, and animal holdings. This comprehensive dataset enables a thorough analysis of the conflict's direct effects.

To assess household food insecurity, the study employed instruments from the Food and Nutrition Technical Assistance Project guidelines (Swindale & Bilinsky, 2006), using 30-day food intake recalls across nine food groups in low-income settings. Household nutrition security was evaluated via the Dietary Diversity Score (DDS) method, based on 24-hour recalls across 12 food groups (Swindale & Bilinsky, 2006; Coates et al., 2007). Additionally, subjective poverty was measured using a categorical scale (1 = very poor, 2 = poor, 3 = medium, 4 = rich, 5 = very rich), while objective poverty was determined through an income-based approach, applying the \$2.15 per day international poverty line.

1.2.5 Operational definitions and measurement

I. Fixed Assets and Infrastructure (Damage Assessment)

Building and Building parts/Components The monetary value of destruction (Minor to Complete Damage) to fixed structures used for production, services, trade, or residence (e.g., administrative, commercial, residential buildings).

Measurement: Assessed by the Replacement Cost of the damaged component or the entire structure, including labor and transportation costs, distinguishing between the specific Damage Type (e.g., destroyed, burned).

Fixed Asset Long-term tangible assets necessary for ongoing production or service delivery. Measurement: Assessed as Damage using the Prevailing Replacement Cost.

II. Machinery, Vehicles, and Equipment

Vehicle and Vehicle Parts: The monetary value of damage, theft, or destruction of motorized transportation assets such as cars, trucks, and vehicles used for trade, agriculture, or public services. Measurement: Assessed by the prevailing replacement cost of the vehicle or specific damaged/missing parts.

Electrical Equipment: Components related to power supply and infrastructure, often implicitly covered under the trade, agriculture, or manufacturing sectors. Measurement: Assessed by the prevailing replacement cost of specific equipment like transformers, wiring, or industrial machinery.

Electrical and Electronic Equipment in Service Sectors: The value of ICT items and related assets, including computers, servers, UPS, printers, and telecommunications gear. Measurement: Categorized within the service sector damage and assessed by the prevailing replacement cost of new equivalents.

Waste Disposal Equipment: Equipment related to sanitation and waste management, typically falling under public sector or services infrastructure. Measurement: Assessed by the prevailing replacement cost of machinery, vehicles, and tools specific to waste disposal.

Generators and Vehicles: Assets essential for operations, especially during service interruptions like sieges or blockades. Measurement: Assessed by the prevailing replacement cost of generators and vehicles.

Furniture and General Durable Goods:

Office Furniture/Equipment: Non-ICT assets in offices, usually part of the furniture, fixtures, and equipment (FFE) category. Measurement: Assessed by the prevailing replacement cost for items such as desks, chairs, filing cabinets, and general office machinery.

Durable Goods: Assets designed for long-term use across multiple sectors, including machinery, equipment, vehicles, and other non-consumable physical assets. Measurement: Assessed based on their prevailing replacement cost, typically classified as fixed assets.

Furniture and Fixtures (FFE): Non-ICT movable items in commercial, financial, or government buildings, such as desks, safes, and counters. Measurement: Assessed by the prevailing replacement cost for similar new items.

1.2.6 Quality Assurance Measures

To ensure the quality and reliability of the data collected for DaLA, we applied the following quality control techniques at different stages of the data collection process:

Data collection Design: We designed the data collection instruments (questionnaires) based on the socioeconomic damage and loss data collection format of *Sendai Framework* (Aitsi-Selmi et al., 2015; UNISDR, 2016, 2017) and adapted them to the context and needs of Tigray region. We collected individual or household level data from households, sector level data from private firms (agriculture, manufacturing, productive service, trade and finance) and public institutional damage level data from public institutions and methods (census) based on the availability and accessibility of the information. The data collection executed using open data kit (ODK) mobile data collection application tool.

Data collection instrument validation: We validated the data collection instruments (questionnaires) by conducting a pilot test with a small sample of respondents from different sectors and locations. We used various methods to assess the clarity, relevance, and completeness of the questions, such as cognitive interviews, feedback forms, and expert reviews. We also used various methods to measure the internal consistency of the instruments.

Data collection training: For the household census, we trained more than 35000 enumerators and 6,000 supervisors who were selected based on their qualifications and experience in economics, statistics, finance, marketing, management, public administration, civil engineering, computer science, Agriculture, animal science, and veterinary sciences. On the other hand, 3000 enumerators were selected for enterprise census. The training lasted for three consecutive days and covered the essence and concept of the questionnaire focusing on how to fill the ODK application and how to get a real practice of the ODK.

The training was given in three layers: first at regional level as a TOT by experts of the commission and was given for experts from four universities and province administration; second, the second training was given at province level by experts from universities (those who took the TOT at regional level) and was given to district experts, supervisors, coordinators and experts from nearby universities. The third layer training was given at district level to data collectors and coordinators by those who received the previous training at province level.

Data collection supervision: We supervised the data collection process at all levels by assigning experts, supervisors and coordinators from the commission, from those who took the

training. The supervisors/coordinators monitored the performance and quality of the enumerators' work, provided feedback and guidance, resolved any issues or challenges, and ensured compliance with ethical standards. The supervisors also reported to the technical crew at province and regional level. For the valuation of damage of buildings, machinery and vehicles, a crew composed of economists and civil or mechanical engineers were responsible to measure the type, severity and amount of damage. The valuation of building damage was done based on the unit cost set by the Bureau of Construction and City Development of Tigray revised in every three months.

1.2.7 Assumptions and Considerations

The Economic Damage and Loss Assessment (DaLa) for the Tigray region relies on several critical assumptions to estimate the financial losses and impacts of the war and blockade. Firstly, the assessment was designed to encompass a full census of approximately 1.3 million households, along with 161,000 private businesses and 81 public institutions. However, due to political insecurity, logistical, and technical constraints, only a partial sample of households has been included, potentially introducing a 10% bias in the data influenced by conflict narratives and other factors that may affect the accuracy of damage and needs assessments.

To categorize damage severity, the assessment assumes that damage levels of 76–100% indicate complete destruction, 51–75% represent severe damage, 26–50% denote moderate damage, and below 26% signify minor damage. Additionally, goods that are stolen or missing are classified as completely destroyed (76–100%), with no insurance coverage assumed for these losses.

For loss calculations, the assessment assumes that losses in 2023 will grow linearly from those recorded in 2021 and 2022. Although no data was collected for 2023, losses for that year are estimated based on 2022 figures, with the expectation that losses will continue to accumulate until a recovery and compensation program is implemented. The assessment only accounts for losses up to 2023, as no recovery program is currently in place. The calculations further assume that no significant interventions have been implemented, resulting in an expectation of nearly full recovery requirements. In estimating additional costs, such as purchases, rentals, and repairs, the assessment accounts for higher prices in Tigray compared to Ethiopia's capital. To reflect this, the prices of identical goods sold in the capital are deducted from those purchased in Tigray to isolate region-specific cost increases.

The assessment also assumes that the impacts of the conflict and siege vary significantly within and beyond Tigray, manifesting as immediate, short-term, and long-term effects. Long-term impacts are expected to be particularly severe without an urgent and equitable recovery program, although such impacts are not thoroughly accounted for in this assessment. The accuracy of household data is assumed, considering changes in production, consumption, migration, and demographics due to the conflict. The complete siege, which disrupted banking, input supplies, transportation, hospitals, and schools, is assumed to directly correlate with economic losses, justifying the inclusion of siege-related losses in the calculations, more than in any other region in the world. This enabled a comprehensive explanation to conduct a full survey assessment.

In assessing needs, the methodology considers varying levels of community resilience and recovery capacity, influenced by social cohesion, historical context, and existing social networks in Tigray. The presence or absence of law and order is assumed to significantly affect recovery efforts and regional stability, with a lack of law and order likely to exacerbate food insecurity, poverty, aid delivery challenges, and safety risks for the affected population. Finally, the assessment recognizes that unresolved issues may lead to recurring conflicts, which could undermine sustainable development and peace-building efforts in Ethiopia, emphasizing the need for comprehensive and timely interventions.

1.2.8 Ethical Considerations

The Assessment follows some ethical issues and principles that guide researchers, data collectors, supervisors, coordinators. These include:

Respect for human dignity: This is an issue that requires the assessment process to respect the inherent worth and value of every human being, regardless of their race, ethnicity, gender, age, religion, culture, etc. The assessment follows this principle by ensuring that it does not harm, exploit, or discriminate against any person or group involved or affected by the research.

Informed consent: This is an issue that requires the assessment to obtain the voluntary and explicit agreement of the participants or stakeholders to take part in the assessment or to provide and use their data or information. The assessment follows this principle by providing clear and comprehensive information about the purpose, methods, risks, benefits, and alternatives of the assessment, as well as the rights and responsibilities of the participants or stakeholders.

Confidentiality and anonymity: This are an issue that requires the assessment to protect the identity and privacy of the participants or stakeholders who provide data or information for the research. The assessment follows this principle by using various techniques, such as encryption, pseudonymization, aggregation, etc., to prevent or minimize the disclosure or identification of personal or sensitive data or information

1.2.9 Data Management and Analysis

Data validation: We validated the data collected from different sources and methods by cross-checking, triangulating and corroborating them with each other

Data cleaning: We cleaned the data collected from different sources and methods by removing or correcting any errors or outliers that may affect the accuracy or consistency. For example, we removed any incomplete or duplicate records of any household or private enterprise data; we corrected any missing data or incorrect labelling; we imputed any missing values using appropriate methods of imputation.

Merging Data: We integrated the data collected from different sources and methods into a single or coherent datasets that can be used for analysis and reporting. For example, we aggregated the data collected from different levels (districts, provinces, regions) into a regional level dataset; we harmonized the data collected from different formats (ODK application, paper questionnaire etc.) into a standard format.

Data analysis: The assessment used descriptive analysis to summarize and describe the main features or patterns of the data collected. The team, among the descriptive analysis tools, used descriptive analysis methods such as frequency, tabulation, proportion, bi-charts, bar graphs, histograms, etc., to present and visualize the data collected. Depending on the nature of the sector, an inferential method such as before - after and trend analysis methods are also a plus for the selected topics when it seems necessary.

1.2.10 Limitations of the study

The single most debilitating limitation of the Tigray Damage and Loss Assessment (DaLA) Report is its incomplete census coverage achieving only 52% (657,360 of ~1.27 million targeted households), 37.5% of private firms, and excluding the entire Western Zone plus inaccessible woredas in Eastern, Northwestern, and Southern zones resulting in systematic underestimation of damages and losses, particularly in the most war-ravaged areas under

Eritrean and Amhara control. This geographic and demographic gap fundamentally undermines the report's claim to provide a "comprehensive" baseline for accountability, recovery, and justice.

The Western Zone, home to approximately 1 million pre-war residents and critical agricultural and industrial hubs like Humera, the sesame export capital, has suffered near-total destruction and ethnic cleansing. Satellite imagery indicates that 80–90% of structures have been razed, and reports of livestock looting are at 100% (Amnesty International, 2021; World Peace Foundation, 2022). Its exclusion—cited as being due to "security constraints"—overlooks the epicenter of scorched-earth tactics, forced starvation, and industrial sabotage, such as the destruction of the Almeda Textile and Saba Cement factories. Similarly, inaccessible woredas in contested zones have witnessed mass atrocities, yet data from these areas is either absent or represented only through partial inputs from internally displaced persons (IDPs), which capture only the losses of displaced survivors and not the in-situ destruction.

This partiality leads to significant selection bias. The surveyed areas Central, Southeastern, and Mekelle—were under Tigrayan control after 2021, potentially administered by the interim regional administration. As a result, the report's household data reflects only 52% geographic representativeness at best, which underestimates the overall material loss for the full population. Additionally, private sector coverage, at 37.5%, further distorts estimates for manufacturing and trade, as looted border factories, such as Mesfin Industrial Engineering, are underrepresented.

Methodologically, the DaLA's ambition for a census devolved into a stratified convenience sample, undermining its rationale for census oversampling, which aimed to avoid subgroup bias. Projected losses for 2023, derived from linear extrapolation of 2022 data, along with baseline averages from 2018 to 2020, exacerbate this gap by assuming uniform impact across excluded zones—an assumption that is statistically indefensible given the genocidal intensity in Western Tigray. The partial integration of internally displaced persons (IDPs) offers only symbolic inclusion, not a quantitative remedy; their asset losses remain unverifiable without verification from their original sites.

The international report's total of \$22.7 billion is likely conservative, potentially underestimating actual losses by 30–50% if the Western Zone's per capita damage mirrors that of the Central Zone. This underestimation hampers accountability, as it is impossible to attribute responsibility for crimes in unsurveyed mass graves and looted farms. Additionally,

it affects recovery planning, leading to misallocation of reconstruction funds away from occupied zones. Future reports should prioritize satellite-validated proxy surveys or allow third-party access to excluded areas; without these improvements, the DaLA will remain an incomplete narrative rather than a comprehensive historical record.

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Household livelihood



Chapter 2 : Damage and Loss Results

2.1 Damage and Loss to Household

2.1.1 Pre-war Context

Primary Economic Livelihoods

The economy of the Tigray Regional State, with an estimated population of nearly 5.7 million (ACAPS, 2021), was predominantly rural, with 75% of the population engaged in farming (World Peace Foundation, 2022). Household livelihoods were built upon two main pillars:

Subsistence Agriculture: This was the backbone of the rural economy, where smallholder farmers, operating on small, fragmented plots (often less than one hectare), primarily grew rain-fed subsistence crops such as teff, wheat, barley, and pulses (Nyssen et al., 2023). Through decades of concerted effort and investment in soil and water conservation, agricultural production had seen significant gains, with crop yields increasing substantially between 2000 and 2020, partly due to the promotion of improved seeds and mineral fertilizers (World Peace Foundation, 2022).

Livestock Rearing: Livestock farming was a crucial component, especially for cash income, often providing more substantial revenue than cash crops in many zones. The region had a large population of livestock, including cattle, sheep, and goats (Nyssen et al., 2023). Tigray was also known for its beekeeping, with honey production providing a substantial additional income stream for tens of thousands of farmers (World Peace Foundation, 2022).

Non-Farm Activities: In addition to agriculture, a growing number of households relied on non-farm activities, including wage employment, handicraft production, and local trade, particularly in urban centers like Mekelle, contributing to a diversified livelihood base (Abay et al., 2022).

Socio-Economic Progress and Challenges

Prior to the war, Ethiopia as a whole was one of the world's fastest-growing economies, and Tigray had made considerable progress in social and economic indicators (World Bank, 2022). However, structural vulnerabilities persisted:

Food Insecurity: Despite improvements, Tigray's livelihoods were highly dependent on rainfall, and the region struggled with agricultural productivity challenges, land degradation, and climate variability. Even in October 2020, significant food insecurity existed, with over 346,000 people classified in Crisis (IPC Phase 3) and 82,000 in Emergency (IPC Phase 4), a situation already projected to worsen before the war began (ACAPS, 2021).

Poverty: The region continued to face the highest poverty rate in the country, despite concerted efforts and programs like the Productive Safety Net Programmed (PSNP) which helped reduce poverty from 48% to 29% between 1991 and 2018 (World Peace Foundation, 2022; ACAPS, 2021).

Infrastructure: The region had seen significant investments in infrastructure, which supported economic growth (UPR Info, 2025). Urbanization was increasing, though the region remained largely rural (ACAPS, 2021).

In summary, the pre-war context was characterized by an agricultural system that had achieved significant progress in productivity and conservation but remained structurally vulnerable to climate shocks and was a major source of pre-existing, significant food insecurity.

2.1.2 Results

Respondent Profile

Table 1 presents the frequency distribution of household heads by zone. The table shows the number of households and the percentage of households in each zone. The highest percentage of household heads was found in the Central zone, accounting for 36.61% of all household heads. The Eastern zone had the second-highest percentage of household heads at 25.98%. The Mekelle zone had the third-highest percentage of household heads at 12.36%, followed by the North West zone at 13.47%. The South and South-Eastern zones accounted for 6.12% and 5.32% of all household heads, respectively. Finally, the West zone had the lowest number of household heads, accounting for only 0.14% of the total. In this census assessment, the total number of household heads included in the table was 657,360, and 2,442,073 individuals from 7 zones—88 *Woredas* and 660 *Tabias*—were assessed to estimate household assets, livestock, and crop damages as well as losses (Table 1). Overall, the coverage of this number of household heads in this survey was about 47% of the total household heads in Tigray. This means that about half of the household heads in Tigray were assessed, and the other half were not covered due to security and inaccessibility issues.

Table 1. Household Heads by Zone

Zone of the household	Number of Respondents	Share(%)
Central	240,642	36.61
Eastern	170,776	25.98
Mekelle	81,261	12.36
North West	88,537	13.47
South	40,229	6.12
South Eastern	34,988	5.32
West	927	0.14
Total	657,360	100.00

Source: CITG Survey, 2022

Table 2 shows the frequency distribution of household heads' sex by zone. The table presents the percentage of female and male household heads and the total number of household heads in each zone. In the Central zone, 33.14% of household heads were female, while 66.86% were male. The Eastern zone had a higher percentage of female household heads at 49.28%, while male household heads accounted for 50.72%. In the Mekelle zone, 40.35% of household heads were female, while 59.65% were male. The North West zone had a slightly lower percentage of female household heads at 37.75%, while male household heads accounted for 62.25%. In the South and South-Eastern zones, the percentage of female household heads was 37.35% and 30.45%, respectively. Male household heads accounted for 62.65% and 69.55% of all household heads in the South and South-Eastern zones, respectively. Finally, in the West zone, 37.00% of household heads were female, while 63.00% were male. The total percentage of

female household heads across all zones was 38.97%, while male household heads accounted for 61.03% of all household heads. It is interesting to note that the percentage of female household heads in the Census Total was 51.77% while male household heads accounted for 48.23%. This suggests that there is a significant discrepancy between the percentage of female household heads in the overall population and the percentage in each zone.

Table 2. Household Heads' Sex by Zone

Zone of the household	Household Sex		
	female	male	Total
Central	79760	160882	240642
Eastern	84152	86624	170776
Mekelle	32792	48469	81261
North West	33426	55111	88537
South	15027	25202	40229
South Eastern	10653	24335	34988
West[IDP]	343	584	927
HH Total	256153	401207	657360
Census Total	1,264,317	1,177,756	2,442,073

Source: CITG Survey, 2022

Table 3 shows the distribution of household heads' locations by zone, categorized into rural and urban areas. The Central Zone had 151,782 households living in rural areas, 88,860 households living in urban areas, and a total of 240,642 households included in the entire assessment, with 63.07% residing in rural areas and 36.93% in urban areas. In the Eastern Zone, 92,642 households living in rural areas and 78,134 households residing in urban areas were surveyed, for a total of 170,776 households, with 54.25% living in rural areas and 45.75% in urban areas. The Mekelle zone had 1,092 households residing in rural areas, 80,169 households residing in urban areas, and a total of 81,261 households, with only 1.34% living in rural areas and 98.66% in urban areas. In the North West zone, 33,620 households residing in rural areas and 54,917 households residing in urban areas were surveyed, for a total of 88,537 households, with 37.97% living in rural areas and 62.03% in urban areas. The South zone had 28,805 households residing in rural areas, 11,424 households residing in urban areas, and a total of 40,229 households, with 71.60% living in rural areas and 28.40% in urban areas. The South Eastern zone had 31,062 households residing in rural areas and 3,926 households residing in urban areas, for a total of 34,988 households, with 88.78% living in rural areas and 11.22% in urban areas. The demographic assessment further revealed that 51.59% of the household heads are rural residents, while the rest 48.41% of them belong to urban settings (Table 3). This shows that the number of rural and urban households is more or less comparable.

Table 3. Household Heads' Location by Zone

Zone of the household	Residence of Household Heads		
	rural	Urban	Total
Central	151782	88860	240642
Eastern	92642	78134	170776
Mekelle	1092	80169	81261
North West	33620	54917	88537
South	28805	11424	40229
South Eastern	31062	3926	34988
West	160	767	927
Total	339163	318197	657360

Source: CITG Survey, 2022

Table 4 provides a tabulation of household heads' religion by zone. The table lists seven zones: Central, Eastern, Mekelle, North West, South, South Eastern, and West. The total number of households is 636,360. The table includes five religion categories: Muslim, Catholic, Orthodox, Other, and Protestant. The majority of households practice the Orthodox religion, with a percentage of 96.88%. Muslim is the second most common religion, with a percentage of 2.67%. The remaining religions, including Catholic, Other, and Protestant, have a combined percentage of 0.42%. The highest percentage of Muslim households is in the South zone, with 4.57%, while the highest percentage of Catholic households is in the Eastern zone, with 1.17%. The Central zone has the highest percentage of Orthodox households, at 97.86%, while the highest percentage of Protestant households is in the Mekelle zone, with 0.29%. The West zone has the smallest number of households, with a total of 927.

Table 4. Household Heads' Religion by Zone

Zone of the household	Household's religion					Total
	Muslim	catholic	Orthodox	other	protestant	
Central	4980	26	235,484	51	101	240642
Eastern	3501	1990	165,143	20	122	170776
Mekelle	3282	193	77,502	49	235	81261
North West	3893	15	84,545	13	71	88537
South	1839	3	38361	8	18	40229
South Eastern	86	2	34896	2	2	34988
West	3	0	924	0	0	927
Total	17,584	2,229	636,855	143	549	657,360

Source: CITG Survey, 2022

Table 5 provides a breakdown of the race of household heads by zone. The table shows the number and percentage of household heads for each race in each zone. The zones included in the table are Central, Eastern, Mekelle, N/West, South, S/Eastern, and West. The races listed are Erob, Kemant, Kunama, Afar, Agew, Amhara, Debub, Oromo, other, and Tigrian. For example, in the Central zone, 240,439 household heads were identified as Tigrian, making up 99.92% of household heads in the entire zone. Similarly, in the Eastern zone, 2,621 household heads were identified as Erob, making up 1.53% of household heads in that zone. Overall, the

table provides a detailed breakdown of the race of household heads in each zone, allowing for a better understanding of the demographics of the population.

Table 5. Household Heads' Race by Zone

Zone of the HH	Household Head Race									
	Erob	Kemant	Kunama	Afar	Agew	Amhara	Debub	Oromo	other	Tigrian
Central	36	20	5	4	12	58	22	24	22	240,439
Eastern	2,621	10	15	52	19	59	17	43	33	167,907
Mekelle	170	6	13	34	12	165	18	37	49	80,757
N/West	24	4	14	14	6	161	28	29	36	88,221
South	7	0	3	31	4	67	4	4	1	40,108
S/Eastern	3	1	7	3	3	6	0	2	2	34,961
West	1	4	0	0	0	1	0	0	0	921
HH Total	2862	45	57	138	56	517	89	139	143	653,314
Census	9,849	168	258	511	221	1,329	205	449	615	2,428,425

Source: CITG Survey, 2022

Table 6 displays the distribution of family size across different zones of households. The table shows that the Central zone has the highest frequency of households with a family size of 4.149, followed by the South Eastern zone with a mean family size of 3.997. The Mekelle zone has a mean family size of 3.589, while the North West zone has a mean family size of 3.692. The South and South-Eastern zones have mean family sizes of 3.575 and 3.997, respectively. The West zone has the lowest frequency of households, with a mean family size of 3.821. The total head count of households is 657,360, with a mean family size of 3.824. The total number of individuals recorded in the census is 2,442,073, with a mean family size of 3.824. The household heads were reported to have an average family size of 3.824 (Table 6). This shows that the family size is small compared with the previously reported family size.

Table 6. Family Size by Zone

Zone of the household	Family Size	
	Number of respondents	Mean
Central	240,642	4.149
Eastern	170,776	3.572
Mekelle	81,261	3.589
North West	88,537	3.692
South	40,229	3.575
South Eastern	34,988	3.997
West	927	3.821
Total Head	657,360	3.824
Total Census	2,442,073	3.824

Source: CITG Survey, 2022

Based on Table 7, which provides a tabulation of Household Heads' Education Level by Zone, we can see that the Mekelle Zone has the highest number of household heads with 10.311 years of schooling, followed by the Central Zone with 8.203 years of schooling, and the North West with 8.136 years of schooling. The zone with the lowest number of years of schooling was South Eastern with 6.655 years of schooling. In terms of the total number of household heads,

the Central zone had the highest number with 240,642, followed by Eastern with 170,776, next followed by North West with 88,537, and Mekelle with 81,261. The total number of household heads in the census was 657,360, with an average of 8.190 years of schooling, while the total number of individuals in the census was 2,442,073, with an average of 6.035 years of schooling.

Table 7. Household Heads' Education Level by Zone

zone of the household	Year of Schooling	
	Number of respondents	Mean
Central	240,642	8.203
Eastern	170,776	7.742
Mekelle	81,261	10.311
North West	88,537	8.136
South	40,229	7.192
South Eastern	34,988	6.655
West	927	7.948
Total Head	657,360	8.190
Total Census	2,442,073	6.035

Source: CITG Survey, 2022

Table 8 shows the tabulation of household heads' age by zone. The table presents data from seven different zones, including Central, Eastern, Mekelle, North West, South, South Eastern, and West. The table reports the number of household heads for each zone along with their average age. According to the table, the zone with the highest number of household heads is Central, with 240,642 heads, while the zone with the lowest number of household heads is West, with only 927 heads. The average age of household heads across all zones is 47.179 years. When looking at the average age of household heads by zone, the Eastern zone has the highest average age at 49.526 years, followed by the South Eastern Zone with a mean age of 48.465 years, while the West zone has the lowest average age at 38.718 years. The data in the table can provide insights into the demographics of household heads in the different zones.

Table 8. Household Heads' Age by Zone

Zone of the household	Household Head's Age	
	Number of respondents	Mean age
Central	240,642	47.615
Eastern	170,776	49.526
Mekelle	81,261	42.581
North West	88,537	45.525
South	40,229	46.622
South Eastern	34,988	48.465
West	927	38.718
Total Head	657,360	47.179
Total Census	2,442,073	25.129

Source: CITG Survey, 2022

Damage to Durable Assets

Damage item type

In Table 9 below clearly illustrates the extensive damage to household durable assets in Tigray during the 2021/2022 war, totaling an estimated \$843.00 million in damage value across surveyed households. The magnitude of this loss highlights a severe disruption to basic living standards and economic well-being. The asset categories with the highest reported damage value are Cars at \$105.83 million, and the aggregate "Other" category at a staggering \$477.03 million, suggesting significant, diverse losses beyond the specific items listed. Beyond vehicles and the 'Other' category, major financial losses stem from gold/silver (\$47.53 million), Clothes (\$37.10 million), Bed (\$22.44 million), and Sofa (\$19.96 million), indicating substantial looting or destruction of both high-value and essential personal items.

Table 9. Households by damaged assets and Damage value in 2021/2022(US\$ in Millions)

Damaged Assets List	Number of respondents	Quantity Damaged	Damage Value (US\$ in Millions)	Share (%)
Car	2,710.00	3,192.00	105.83	12.55
Cycle	5,466.00	6,723.00	1.72	0.20
motor cycle	2,156.00	2,569.00	8.23	0.98
Bajaj	1,589.00	1994.00	8.41	1.00
Three wheels	321.00	438.00	1.46	0.17
horse cart	2,135.00	2552.00	1.67	0.20
Cart	778.00	2255.00	0.67	0.08
Jerrycan	52,367.00	200,781.00	1.08	0.13
Refrigerator	18,608.00	24,616.00	17.84	2.12
Laundry	957.00	1,993.00	2.21	0.26
gold/silver	28,807.00	848,009.00	47.53	5.64
Sofa	6,062.00	28,164 .00	19.96	2.37
Bed	33,060.00	72,308.00	22.44	2.66
Cupboard	12,695.00	18,303.00	8.52	1.01
Blanket	63,621.00	160,695.00	10.92	1.30
Clothes	45,433.00	633,201.00	37.10	4.40
Table	9,575.00	38,138.00	2.84	0.34
Chair	16,159.00	159,741.00	12.60	1.49
Stove	7,286.00	10,098.00	0.86	0.10
Modern stove	7,151.00	9,570.00	0.87	0.10
Solar	25,569.00	35,484.00	3.02	0.36
Generator	3,141.00	4,193.00	7.54	0.89
Ventilator	1,470.00	2,612.00	0.61	0.07
Heater	150.00	225.00	0.05	0.01
Boiler	904.00	1,314.00	0.20	0.02
TV	31,003.00	34,535.00	13.94	1.65
laptops/computers	7,348.00	9,222.00	6.61	0.78
Mobile	57,051.00	100,898.00	16.89	2.00
Camera	1,728.00	2636.00	3.07	0.36
Radio	12,527.00	15,788.00	0.67	0.08
Power meter	1,499.00	1,640.00	0.27	0.03
Water meter	1,105.00	1,266.00	0.19	0.02
Other	236,965.00		477.03	56.59
Total	697,374		843.00	100.00

Source: CITG Survey,2022

The comprehensive damage to durable assets has profound and complex implications for Tigray households, severely undermining their capacity for recovery and stability:

Destruction of Wealth and Savings: The destruction or looting of high-value assets like Cars (\$105.83M) and gold/silver (\$47.53M) represents a catastrophic loss of household wealth and savings. This not only strips families of valuable, often liquid, financial reserves but also eliminates assets that could be used for economic recovery, investment, or collateral for loans. The loss of such assets makes it incredibly difficult for households to restart livelihoods or cope with future shocks.

Loss of Livelihood and Mobility: Damage to transport assets like Cars, motorcycles (\$8.23M), Bajaj (\$8.41M), and Three wheels (\$1.46M) directly impacts household mobility and the ability to earn a living, especially for those involved in transport, trade, or agriculture. Similarly, the destruction of horse carts (\$1.67M) and Carts (\$0.67M) affects rural livelihoods and the transportation of goods and water, a basic necessity, which is further complicated by the damage to over 200,000 Jerrycans (\$1.08M).

Deterioration of Living Conditions and Health: The loss of essential household items like Beds (\$22.44M), Blankets (\$10.92M), Sofa (\$19.96M), and Clothes (\$37.10M) means households face significant hardship in maintaining basic standards of living, comfort, and hygiene, especially in the absence of robust humanitarian aid. The damage to Refrigerators (\$17.84M) impacts food storage and preservation, while the loss of Stoves (\$0.86M) and Modern Stoves (\$0.87M) compromises safe cooking and heating.

Setback to Modernization and Connectivity: The extensive damage to electrical and communication infrastructure, including TVs (\$13.94M), Mobiles (\$16.89M), laptops/computers (\$6.61M), Solar panels (\$3.02M), and Generators (\$7.54M), reverses years of progress in access to information, education, and modern energy sources. This loss hinders remote work, educational opportunities, and access to vital communication networks necessary for post-war recovery and rebuilding social cohesion. The widespread destruction of durable assets, which includes both high-value and essential items, represents a significant decapitalization of the Tigray population. The scale of the reported damage indicates a humanitarian and developmental crisis, demanding massive, sustained efforts for recovery and replacement to restore household self-sufficiency and economic function.

Damage type

Table 10 indicates that the vast majority of the \$843.08 million in damage to household durable assets in Tigray is attributed to the deliberate actions of Looting, which accounts for a staggering 79.4% (\$669.34 million) of the total damage value. This is followed by assets categorized as Missing (13.07% or \$110.18 million), which likely also includes stolen or misappropriated items. Damage resulting from direct combat, such as assets that were burned (3.71% or \$31.28 million) or Broken (3.83% or \$32.29 million), represents a relatively minor share of the total financial loss.

Table 10. Damage value by Damage Type for Durable Assets

Damage Type	Quantity	Damage Value (US\$ in Millions)	Share (%)
Burned	90101	31.2753	3.71
Broken	93266	32.2869	3.83
Looted	1933511	669.342	79.4
Missing	318,274	110.1801	13.07
Total		843.0843	100

Source: CITG Survey, 2022

The overwhelming dominance of looting and missing assets in the damage report has critical implications regarding the nature and intent of the actions against Tigrayan households. This distribution strongly suggests that the financial devastation was not primarily an accidental consequence of fighting, but rather the result of a systematic, targeted campaign of asset appropriation and economic warfare. The high percentage of looted and missing goods implies a clear intention to decapitalize the civilian population, strip them of their wealth and means of production, and severely undermine their capacity for rapid post-war recovery. Looting targets both high-value items (like gold, cars, and electronics) and essential goods (like clothing and furniture), directly contributing to both the long-term insolvency of families and an immediate humanitarian crisis by leaving them without basic necessities. This pattern of damage reflects an intent to impose maximum economic harm on the civilian population well beyond the direct scope of military necessity.

Damage Severity Level

In the Table 11 on the damage severity level for household durable assets in Tigray shows that the overwhelming financial loss is due to Complete Damage, accounting for an astonishing 93.38% (\$787.19 million) of the total \$843.00 million US\$ economic damage value. Conversely, damage classified as Minor Damage (1.32% or \$11.13 million), Moderate Damage

(1.54% or \$12.98 million), and Severely Damaged (3.75% or \$31.61 million) is financially marginal compared to the destruction.

Table 11. Damage Value by Damage Severity Level for Durable Assets

Damage Severity Level	Quantity Damaged	Damage Value (US\$ in Millions)	Share(%)
Minor Damage	33233	11.13	1.32
Moderate Damage	37001	12.98	1.54
Severely Damage	91213	31.61	3.75
Complete Damage	2,273,705	787.19	93.38
Total		843.00	100

Source: CITG Survey, 2022

The extremely high share of the total damage value attributed to Complete Damage has critical implications regarding the intensity and long-term consequences of the destruction:

Total Loss of Asset Base: The dominance of Complete Damage signifies that the majority of affected durable assets are not repairable, but are entirely destroyed, looted, or permanently unusable. This translates into a total loss of capital for the households, demanding complete replacement rather than repair. This dramatically inflates the cost and time required for recovery.

Intention and Force: This severity level, especially when correlated with the previous finding that looting was the primary damage type, suggests that the perpetrators often aimed for the permanent removal or destruction of assets rather than simple incapacitation. Looted items, which are classified as a complete loss to the household, drive this high percentage.

Impediment to Humanitarian and Development Efforts: The minimal share of minor and moderate damage means that relief efforts cannot rely on quick fixes or temporary aid; instead, they require massive, long-term resource mobilization for the procurement and distribution of entirely new assets. The widespread complete destruction of assets essential for daily life, such as beds, kitchen equipment, and vehicles, compounds the humanitarian crisis, ensuring that households will struggle for years to regain their pre-war economic function and standard of living without substantial external support.

Damage by Perpetrators

In Table 12, analysis of the perpetrators responsible for the \$843.00 million in damage to household durable assets in Tigray reveals a significant concentration of responsibility among organized armed groups. The two primary contributors to the financial loss are the Ethiopian National Defence Force (ENDF), accounting for the largest share at 47.06% (\$396.72 million), and the Eritrean defence Force (EDF), responsible for a substantial 39.03% (\$329.02 million). Together, these two national forces are implicated in the vast majority, over 86% of the total reported damage value.

Table 12. Damage Value by Perpetrators for Durable Assets

Perpetrators	Damaged Quantity	Damage Value (US\$ in Millions)	Share(%)
ENDF	1,145,982	396.72	47.06
EFP	25326	8.77	1.04
EDF	950,440	329.02	39.03
AMF	14124	75.53	8.96
IRF	56982	19.73	2.34
AFF	14124	4.89	0.58
Others	24108	8.35	0.99
Total		843.00	100

Source: CITG Survey, 2022

The distribution of damage value across the various armed actors has profound implications for understanding the conduct and consequences of the war:

Dominance of National Forces: The overwhelming concentration of damage (86.09%) attributed to the two main national armies, the ENDF and the EDF, signifies that the widespread destruction and looting of civilian property were not merely isolated incidents by irregular forces. Instead, they appear to have been systematic or large-scale actions carried out by organized, state-level military bodies. This raises serious questions about command responsibility and the violation of international humanitarian law concerning the protection of civilian property.

Role of Other Armed Groups: While the national forces dominate the losses, other actors also contributed significantly. Amhara Forces (AMF) are responsible for 8.96% (\$75.53 million) of the damage, indicating their substantial participation in the destruction of household assets. Damage attributed to Illegal Forces (IRF) at 2.34% (\$19.73 million) suggests opportunism and criminal activity compounding the war-related destruction. The contributions of the Ethiopian Federal Police (EFP), Afar Forces (AFF), and 'others' are comparatively minor in financial terms, but collectively, they illustrate the multiplicity of actors involved in the violation of property rights.

Implication for Accountability and Compensation: The clear attribution of the vast majority of the damage to the ENDF and EDF establishes a baseline for accountability. The survey data is crucial for future efforts regarding reparations, reconstruction, and demands for justice. The primary financial burden of property loss is directly linked to the actions of these two military structures, highlighting where responsibility must be assigned for the massive decapitalization of the Tigrayan civilian population.

Damage to Housing and Housing Equipment

Damage item type

Table 13 shows that the damage value of Buildings and Building Accessories in Tigray totals US\$586.57 million. The financial loss is heavily concentrated in a few key categories. The most significant damage is reported for Villa properties, which account for the largest share at 33.43% (\$196.11 million), followed by Floor/Debris damage at 24.43% (US\$143.29 million). The combined financial loss from these two categories alone makes up nearly 60% of the total building damage. The

"Other" category also represents a substantial portion of the loss at 17.11% (\$100.35 million), suggesting diverse and widespread structural harm not covered by the specific items.

Table 13. Damage Value of Building and Building Accessories by Building Items (US\$ in Millions)

Damage Categories	Building	HH frequency	Quantity Damaged	Damage value (US\$ in Millions)	Share (%)
Villa		12,419	25,537	196.11	33.43
Floor/Debri		3,227	5,451	143.29	24.43
Hidmo		6,670	9,871	17.58	3.00
Gebela		2,341	2,909	6.18	1.05
Merebae		9,738	19,291	51.06	8.70
Adarash		9,396	13,478	28.98	4.94
Agudo		2,165	3,179	4.89	0.83
Kitchen		1,666	2,033	1.96	0.33
Mereba		1,356	1,754	3.02	0.51
Compound		2,683	3,745	6.31	1.08
gate/door		28047	60,687	27.21	4.64
Other		25,316	235,235	100.35	17.11
Total		105,034		586.57	100.00

Source: CITG Survey, 2022

The scale and pattern of damage to residential and related structures carry dire implications for the affected population:

Massive Housing Crisis: The total damage of \$586.57 million signifies a catastrophic loss of shelter, directly translating into a severe housing crisis. The destruction of Villas (\$196.11 million) and damages related to Floor/Debri (\$143.29 million) indicate that a large portion of both high-value and foundational residential structures have been rendered unusable or completely destroyed. This displaces families, increases their vulnerability to environmental and health risks, and prevents the return of internally displaced persons (IDPs).

Erosion of Property Capital: Residential buildings are often the single largest asset for a household. The loss of this property capital erases years of investment and savings, plunging families into poverty. Even damage to smaller structures like Merebae (storage/outbuildings at \$51.06 million) and Adarash (halls/living areas at \$28.98 million) represents a severe setback to the household's functionality and ability to store belongings or conduct daily activities.

Compromise of Basic Security and Functionality: The significant damage to gate/door items (\$27.21 million) points to compromised household security, possibly resulting from forced entry during looting or intentional destruction. The destruction of fundamental structures like Hidmo (\$17.58 million) and Merebae not only removes shelter but also disrupts traditional ways of life and the socio-economic function of the dwelling unit.

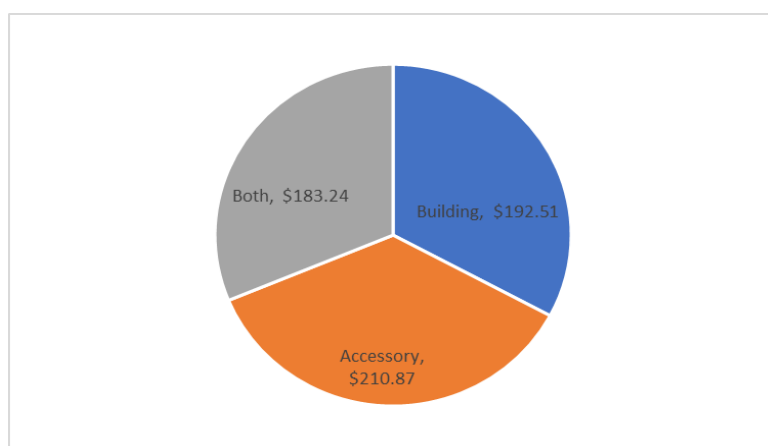


Figure 2: Destroyed Building Status (US\$ in Millions)
Source: CITG Survey, 2022

Based on Figure 2 on the Destroyed Building Status (total damage value of \$586.57 million US\$), which reveals that the financial damage is nearly evenly split between damage to the primary Building structure, damage to Accessories (such as doors, windows, fixtures), and damage to both simultaneously. Building Accessories sustained the highest financial loss at 35.95% (\$210.87 million), followed closely by damage to the main Building structure at 32.82% (\$192.51 million), and damage to both at 31.24% (\$183.24 million).

Damage type

Table 14 categorizes the \$586.57 million in damage value to Buildings and Building Accessories in Tigray by damage type. The most prevalent form of financial loss stems from Partial Demolition, which accounts for the largest share at 48.62% (\$285.19 million). This is closely followed by Full Demolition, making up 30.6% (\$179.49 million) of the total damage. Together, demolition, whether partial or full, constitutes nearly 80% of the financial loss to buildings. Other significant losses are attributed to Broken structures at 11.31% (\$66.34 million), while damages due to fire, Fully Burnt (6.17% or \$36.19 million), and Partially Burnt (3.3% or \$19.36 million) represent the smallest shares.

Table 14. Damage Value of Buildings and Building Accessories by Damage Type (US\$ in Millions)

Types of Damage	Quantity Damaged	Damage Value (US\$ In Millions)	Share (%)
Fully Demolished	117,251	179.49	30.6
Partially Demolish	186,297	285.19	48.62
Partially Burnt	12,645	19.36	3.3
Fully Burnt	23,641	36.19	6.17
Broken	43,336	66.34	11.31
Total		586.57	100

Source: CITG Survey, 2022

The predominance of demolition as the primary type of damage carries severe implications for the scale of destruction and the recovery process:

Systematic Destruction: The fact that demolition (both partial and full) accounts for the vast majority (79.22%) of the damage value indicates the use of heavy force and/or deliberate, systematic destruction rather than collateral damage from light arms fire. Full Demolition (\$179.49M) results in a complete loss of shelter and property capital, while Partial Demolition (\$285.19M) requires extensive and costly structural repair, potentially necessitating complete rebuilding depending on the extent of the damage.

Prolonged Reconstruction Challenge: The high incidence of demolition and the significant structural damage mean that a large portion of the housing stock is structurally compromised and uninhabitable. The repair of partially demolished structures is often complex and more costly per unit than new construction, making the path to recovery significantly more difficult and prolonged.

Evidence of Targeting: When combined with the high rate of looting found in the durable assets data, the prevalent demolition suggests a dual strategy of economic stripping and infrastructure destruction. The high financial toll from demolition implies an intent not just to seize property but to permanently render living spaces unusable, escalating the humanitarian crisis by eliminating shelter and disrupting community stability. This scale of structural damage underscores the immense need for international aid focused on specialized construction and infrastructure rebuilding.

Means of Damage Execution

As stated in Table 15 the total financial damage to buildings and building accessories amounts to \$586.57 million, revealing a systematic strategy that combines military bombardment with deliberate, close-range destruction and plunder. The largest portion of this financial loss is attributed to Looting, which accounts for a substantial 30.30% (\$177.73 million) of the total damage. This is closely followed by losses from Shelling (combining Distance Shelling at 29.81% and Intentional Shelling at 12.03%), which constitutes a combined 41.84% (\$245.42 million) of all recorded damage. Damage resulting from direct hostile intent, categorized as Intentional-destruction (or Distraction in the table), contributes another significant 20.76% (\$121.77 million), while damages caused by Burning are comparatively minor at 5.80% (\$34.02 million).

Table 15. Damage Value of Buildings and Building Accessories by Damage Means (US\$ in Millions)

Means of Damage	Quantity Damaged	Damage Value (US\$ In Millions)	Share (%)
Shelling	94,566.00	245.42	41.84
Distraction	45,285.00	121.77	20.76
Burning	75765	34.02	5.80
Looting	1037974	177.73	30.30
Others	1408834	7.63	1.30
Total		586.57	100.00

Source: CITG Survey, 2022

This pattern of financial loss suggests a dual strategy of destruction and plunder. The dominance of shelling indicates significant use of heavy artillery or indirect fire, resulting in widespread structural damage. Simultaneously, the high value of looting loss refers to the systematic removal of building accessories or integrated fixtures (like doors, windows, and plumbing) and items within the buildings. This suggests that military presence inside or near civilian areas is used to strip essential components, effectively rendering a shelled or damaged building completely uninhabitable and increasing the cost of repair. Furthermore, the significant combined financial share (over 32%) attributed to explicitly hostile actions destruction and shelling strongly implies that a large portion of the damage was not merely collateral, but the outcome of a clear military intent to destroy civilian infrastructure. This intentional, multi-faceted approach to property damage, combining destructive force with theft, significantly compounds the humanitarian and reconstruction burden, requiring households to face both immense rebuilding costs and the challenge of re-fitting homes stripped bare of essential, non-structural components.

Damage Severity Level

As indicated in Table 16, the damage severity is categorized into four levels: minor damage, moderate damage, Severe damage, and complete or near-complete destruction. The overall distribution indicates that nearly 47.3% of the households experienced complete damage, followed by 28.06% that suffered severe damage. Only 10.78% and 13.85% of households reported minor and moderate damage, respectively. This highlights the widespread and catastrophic destruction of residential infrastructure across the region.

Table 16. Damage to Household Housing by Damage Severity Level (US\$ in Millions)

Damage Severity Level	Damaged Quantity	Damage value (US\$ in Millions)	Share (%)
Minor Damage	25593.5	63.23	10.78
Moderate Damage	33465.5	81.24	13.85
Sever Damage	77216	164.59	28.06
Complete damage	246894.5	277.45	47.3
Total		586.57	100

Sources: CITG Survey, 2022

Damage by Perpetrators

As indicated in Table 17 the total financial damage assessed for civilian housing and accessories amounts to \$586.57 million, with the vast majority of this socio-economic harm directly attributable to the two main national armies. Specifically, the Ethiopian National Defense Force (ENDF) is responsible for the largest share, accounting for 50% (US\$293.285 million), and the Eritrean Defense Force (EDF) follows closely, contributing 30% (US\$175.97 million). Collectively, the ENDF and EDF are responsible for a staggering 80% of the total damage, strongly suggesting that the destruction of civilian assets was executed as a large-scale, intentional campaign by these principal military actors. While other groups also played a role including the Amhara Forces (AMF) at 14% (US\$82.12 million), Illegal Forces (IRF) at 3%, the Ethiopian Federal Police (EFP) at 2%, and the Afar Forces (AFF) at 1% their combined financial liability is dwarfed by that of the two primary national forces. This highly concentrated financial responsibility underscores the systematic nature of the destruction inflicted upon the civilian population.

Table 17. Damage to Household Housing by Perpetrators (US\$ in Millions)

Perpetrators	Damage value (US\$ in Millions)	Share (%)
AFF	5.8657	1
AMF	82.1198	14
EDF	175.971	30
ENDF	293.285	50
EFP	11.7314	2
IRF	17.5971	3
Total	586.57	100

Sources: CITG Survey, 2022

Damage to Crop

Damage item type

Cash Crop: As depicted in Table 18 damaged Cash Crop-tree Value is a total estimated economic value of US\$46.734 million to Tigray's agriculture across 2021 and 2022. The most significant financial damage occurred in 2021 at US\$33.314 million, which is more than double

the US\$13.42 million damage value recorded in 2022. Across both years, the greatest financial impact is concentrated in Field Cutting (US\$13.401M) and Field Looting (US\$11.975M), indicating a deliberate, systematic targeting of crops and productive assets. Fruit crops are by far the most financially affected category, accounting for the highest values across nearly all damage types, totalling over US\$42.4 million in combined damage value.

Table 18. Damaged Cash Crop-tree Value (2021-2022) (US\$ in Millions)

Damage Type	Crop Type	Lost Harvest (Quintals) (2021)	Damage Value (US\$ in Millions) (2021)	Lost Harvest (Quintals) (2021)	Damage Value (US\$ in Millions) (2022)	Total Damageable (US\$ in Millions)
Burned	Fruit	12,585.71	4.452	3,098.13	1.10	5.552
	Perennial	11,414.97	0.645	1,417.70	0.14	0.785
	Fodder	188.75	0.017	16.00	0.001	0.018
	Other	376.02				0
	Subtotal	24,706.4	5.114	4,531.8	1.24	6.354
Unplanted	Fruit	16,303.30	5.760	3,460.95	1.22	6.98
	Perennial	6,499.90	0.663	1,633.22	0.06	0.723
	Fodder	247.00	0.022	—	—	0.022
	Subtotal	23,412.00	6.444	5,094.00	1.28	7.724
Field Looting	Fruit	26,644.40	9.417	5,047.75	1.78	11.197
	Perennial	7,649.46	0.710	873.05	0.03	0.74
	Fodder	315.30	0.028	70.00	0.01	0.038
	Subtotal	34,761.00	10.155	5,990.80	1.82	11.975
Field Cutting	Fruit	29,634.87	10.477	4,632.95	1.64	12.117
	Perennial	17,382.60	1.046	2,860.06	0.16	1.206
	Fodder	879.55	0.078	61.00	0.01	0.088
	Subtotal	48,057.00	11.601	7,555.00	1.80	13.401
Unharvested	Fruit	—	—	18,662.12	6.59	6.59
	Perennial			11,105.45	0.69	0.69
	Fodder			38.50	0.003	0.003
	Total			30,855	7.28	7.28
Grand _Total		—	33.314	—	13.42	46.734

Source: CITG Survey, 2022

The extensive and intentional destruction of cash crops has severe, long-term implications for the economic stability and food security of Tigrayan households:

- **Loss of Income and Livelihoods:** The high overall loss of US\$46.734 million represents a catastrophic blow to the primary source of income for many rural households. As cash crops are grown specifically for market sale, the pervasive damage from Field Cutting and Field Looting means farmers lost their entire annual revenue potential. This loss of purchasing power directly inhibits their ability to buy food, seeds, and basic household necessities, trapping them in a cycle of poverty.
- **Targeted Economic Warfare:** The dominance of damage from Field Cutting and Field Looting points to deliberate economic sabotage rather than incidental war damage. Field Cutting (especially of trees) destroys the assets themselves, requiring years to regenerate, while Field Looting is outright theft of the marketable product. This intentional destruction of productive assets, particularly Fruit and Perennial crops,

severely degrades the region's agricultural capacity for years to come, long after the fighting has ceased.

- **Worsened Food Insecurity:** While cash crops aren't the primary staple food, their destruction directly impacts food access. The substantial loss from Unharvested crops in 2022 (US\$7.28M) indicates that war and displacement prevented farmers from simply collecting their ready harvest. This, coupled with the loss of income from sales, converts an economic shock into an acute food insecurity crisis, forcing households to rely entirely on emergency aid.
- **Delayed Recovery of Perennial Assets:** The significant loss of Perennial crops (totalling over US\$2.6M) is a long-term setback. Unlike annual crops, perennial trees (like coffee or fruit trees) take many years to reach maturity and production. Their destruction represents a multi-year loss of income, making post-war agricultural recovery much slower and more capital-intensive, requiring not just new seeds, but years of replanting and cultivation without guaranteed immediate returns.

Table 19. Replacement Cost Value of Damaged Cash Crop-tree (US\$ in Millions)

2021	Number of Respondents	Replanted tree	Replacement value
Fruit	653.00	221,083.50	4.0459
Perennial	663.00	269,886.00	0.3269
Fodder	16.00	1,001.50	0.00092
Sub- Total		495,420	4.374
2022	Number of Respondents	Replanted tree	Replacement value
Fruit	258.00	79,144.00	0.7456
Perennial	304.00	130,939.00	0.1699
Fodder	6.00	5,015.00	0.0018
Sub Total		215,098	0.9173
Grand-Total			5.291

Source: CITG Survey, 2022

The substantial replacement cost value of US\$5.291 million for damaged cash crop trees, particularly for Fruit and Perennial varieties, has critical implications for agricultural recovery and household livelihoods in Tigray:

- **Direct Barrier to Recovery:** The total replacement cost of over US\$5.29 million represents a high financial barrier that most affected farming households cannot meet independently, especially after suffering massive income loss from the destruction and looting of their harvests. Without external funding or government support to cover these costs, hundreds of households (1,332 in 2021 and 570 in 2022) cannot restore their productive assets.
- **Long-Term Income Deprivation:** The high cost is largely concentrated in Perennial and Fruit trees, which do not yield a harvest for several years after planting. This means

the affected households face a multi-year gap in income, even if the replacement costs are covered. The financial value represents the cost of seedlings and planting labour, but the true economic cost to the household is the loss of guaranteed income for the duration it takes for 495,420 trees (in 2021) and 215,098 trees (in 2022) to mature.

- **Need for Targeted Aid:** The data highlights a critical need for targeted agricultural rehabilitation programs beyond basic food aid. Effective recovery requires direct investment to subsidize or cover the replacement value of these trees, combined with support mechanisms to sustain households during the long non-productive period until the new trees yield fruit. Failure to address this replacement cost will permanently degrade Tigray's cash crop sector and exacerbate long-term food insecurity.

Seedlings: Initially, the categories of fruits such as orange, banana, mango, and apple, which is in generally contain the categories of edible ones of fruits. Perennial shows the groups of the non-edible crop. Roots contain crops like carrots, beetroot, and others that are edible but contain roots. The damage to cash crop seedlings in Tigray due to the war, as depicted in Table 20, shows a total economic value of 29,145 units valued at US\$0.24 million across 2021 and 2022. The year 2021 bore the brunt of the destruction, accounting for 82% of the damaged units (24,019) and 63% of the total financial loss (US\$0.15 million). Damage significantly decreased in 2022 to 5,126 units and US\$0.09 million. The Perennial category suffered the most extensive damage, with 18,231 units lost, representing the highest total value at US\$0.14 million. Notably, although fewer perennial units were destroyed in 2022 than in 2021, the associated damage value was higher (US\$0.08 million vs. US\$0.06 million), suggesting the destruction of more valuable individual perennial crops that year. The Fruit category also saw a substantial loss (10,812 units, US\$0.10 million), with the majority occurring in 2021. Damage to Fodder seedlings was minimal and negligible in value.

Table 20. Damaged Cash Crop Seedlings (US\$ in Millions)

Categories	In the Year 2021		In The Year 2022		Total	
	Damaged Units	Damage Value (US\$ in Millions)	Damaged Units	Damage Value (US\$ in Millions)	Damaged Units	Damage Value (US\$ in Millions)
Fruit	9151	0.08	1662	0.02	10812	0.10
Perennial	1476	0.06	3465	0.08	18231	0.14
Fodder	100	0.00			100	0.00
Total		0.15		0.09		0.24

Source: CITG Survey, 2022

The destruction of these perennial and fruit seedlings carries severe implications for household economic resilience and long-term food security in Tigray. Unlike annual crops, these seedlings represent a multi-year investment, and their destruction means not just an immediate

monetary loss but also the loss of future income streams for years to come. This makes immediate recovery challenging, as farmers cannot simply replant and harvest within the next season; they must wait years for new seedlings to mature and become productive. Consequently, the damage to these cash crops prolongs dependence on humanitarian aid, exacerbates poverty, and undermines the local economy's ability to self-recover, forcing households to endure protracted instability and food insecurity.

Crop Tool: The total war-related damage to agricultural tools, infrastructure, and inputs in the study area, as stated in Table 21, reached a staggering US\$31.5 million, affecting 4,229 households and leading to the destruction of 78,113 physical units. The financial loss is highly concentrated in a few high-value categories, indicating a severe blow to mechanized farming and crop protection capabilities. The single largest financial loss is attributed to Knapsack Sprayers at US\$10.795 million, driven by an extremely high number of damaged units (25,104). This is followed by the destruction of a relatively small number of Tractors (931 units), which still accounts for the second-highest damage value of US\$6.908 million, highlighting their high unit cost. Significant losses were also sustained from damaged Fuel (US\$4.682 million) and Water Tubes (US\$2.633 million), underscoring the deep disruption to motorized operations and essential irrigation systems.

Table 21. Crop Tool Damage Value in 2021/2022 (US\$ in Millions)

Categories	No. of Household	Damaged Quantity	Damage value
Water reservoir	59	847	0.084
Newit	563	2,687	0.057
Yoke	307	1,611	0.073
Erfi	195	2,576	0.030
Duguri	109	2,082	0.012
Ploughing share	952	5,686	0.572
Kerfes	310	1,928	0.040
Metsan/Mran	108	4,412	0.076
Tractor	27	931	6.908
Ploughing tractor	34	165	0.859
Mekeskesi tractor	8	417	0.019
Cereal Storing	2	51	0.045
Sherfa	5	7	0.0002
Hive	52	1,972	0.080
Pump motor	82	703	0.495
Water tube	33	2,660	2.633
Knapsack	533	25,104	10.795
Sickle	255	3,182	0.061
Meketketi	19	942	0.028
Axel	417	5,322	1.961
Store	24	61	0.392
Urea fertilizer	24	2,426	0.350
DAP fertilizer	9	1,658	0.035
Improved seed	17	1,429	0.507
Local seed	24	2,384	0.173
Seedling	7	874	0.029

Categories	No. of Household	Damaged Quantity	Damage value
Pesticides	15	748	0.057
Herbicides	13	216	0.043
Fuel	23	4,331	4.682
Compost	3	701	0.447
Total	4,229		31.5

Source: CITG Survey, 2022

The extensive physical damage, however, extends far beyond expensive machinery, demonstrating the war's widespread impact on ordinary farm households. While Knapsack Sprayers had the highest unit count loss, the foundational farming implement, the Ploughing Share, affected the highest number of households (952) and saw the second-highest number of units lost (5,686), showing that even the most basic, essential tools necessary for manual tilling were systematically targeted or destroyed.



Source: CITG Documentation Office, 2022

Furthermore, the damage to a variety of local tools, such as “*Newit*”, “*Erfi*”, and “*Duguri*”, along with the loss of critical inputs like Urea and DAP fertilizers and improved seeds, confirms a comprehensive crisis that has dismantled the entire agricultural production chain. The overall damage profile suggests a deliberate or widespread destruction of assets that is simultaneously financially crushing for infrastructure and crippling to the daily operational capacity of the average farmer.

The implication of this massive and diverse loss is that agricultural recovery in the region will be a protracted, multi-faceted challenge. The sheer financial magnitude of the destroyed assets, particularly the US\$17.7 million losses from Tractors and Knapsack Sprayers, creates an enormous barrier to re-mechanization and modernization, making a rapid return to pre-war productivity levels nearly impossible without massive external investment. Crucially, the damage is not merely financial; the widespread loss of basic tools, seeds, and water infrastructure has created a household livelihood crisis that strips farmers of the fundamental means to work their land. This twin challenge rebuilding expensive infrastructure while

simultaneously resupplying thousands of households with basic, essential tools and inputs will require a comprehensive, phased recovery strategy focused on both high-value aid and broad-based support to restore food security.

Damage type

As Table 22 above shows that the damage type by crop tools damage value in 2021/2022 reveals that the total financial loss of US\$31.50 million to agricultural tools was overwhelmingly caused by the forced removal of assets rather than on-site destruction. Acts of Looting and Stealing together account for a massive 79.16% of the total financial damage, with looted assets alone representing the largest single loss at US\$16.69 million (52.97%). This high proportion of removal is reinforced by the physical quantity data, where 41,376 units were looted and 20,458 units were stolen. Intentional destruction, while present, was secondary: assets that were Fully Burned were the next largest contributor, valued at US\$3.98 million (12.62%), with direct physical destruction like 'fully destroyed' and 'partially destroyed' accounting for only a minor fraction of the total financial loss.

Table 22. Damage Type by Crop Tools Damage Value in 2021/2022 (US\$ in Millions)

Types of Damage	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Stolen	20458	8.25	26.19
Looted	41376	16.69	52.97
Fully destroyed	2461	0.99	3.15
Partially destroyed	555	0.22	0.71
Partial Burned	773	0.31	0.99
Full burned	9858	3.98	12.62
Others	2625	1.06	3.36
Total		31.50	100.00

Source: CITG Survey, 2022

The most critical implication of this damage profile is that the Household sector loss constitutes a major, systemic drain of productive capital from the Tigray economy. Because the majority of crop tools were looted or stolen, these assets are not merely broken, but have been permanently siphoned out of the region, likely to benefit other areas or markets. This significantly complicates recovery efforts, as farmers and aid agencies are faced with the expensive task of procuring and shipping entirely new items, rather than simply repairing or replacing locally destroyed components. Furthermore, the prevalence of theft and looting underscores a fundamental breakdown in property security and resource protection, which will undoubtedly discourage farmers from reinvesting in equipment, thereby lengthening the recovery period and undermining long-term trust in the stability of the household sector

Damage Severity Level

As indicated in Table 23 crop tool damage severity level in 2021/2022, the total financial cost of US\$31.50 million to crop tools is overwhelmingly dominated by Completely Damaged assets, signifying a severe and nearly complete destruction of the productive household's agricultural capital. This most severe category accounts for an astounding 96.85% of the total damage value, equating to US\$30.51 million. The physical destruction is similarly concentrated, with 75,652 units falling into the 'Completely Damaged' level, reinforcing that the vast majority of assets lost were rendered entirely unusable. Conversely, the less severe damage levels, Minor, Moderate, and Severely Damaged, contribute only a negligible portion to the total financial effect. Specifically, 'Severely Damaged' assets account for only US\$0.47 million (1.49%), while 'Minor Damage' and 'Moderate' damage combine for less than US\$0.52 million. This stark distribution indicates that the war's impact on crop tools was not characterized by minor wear-and-tear or repairable damage, but rather by total loss of function and value.

Table 23. Crop Tool Damage Severity Level in 2021/2022 (US\$ in Millions)

Damage Severity Level	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Minor Damage	742	0.30	0.95
Moderate	555	0.22	0.71
Severely Damaged	1164	0.47	1.49
Completely damaged	75652	30.51	96.85
Total		31.50	100

Source: CITG Survey, 2022

The critical implication of this damage severity profile is that the agricultural sector faces a catastrophic and non-recoverable loss of its primary tools and equipment. Since nearly 97% of the financial damage is due to assets being Completely Damaged, the recovery process cannot rely on repairs or partial replacements; it requires the full acquisition and deployment of entirely new tools and machinery. This necessity for complete replacement drives up recovery costs, significantly extending the time and scale of external support required. The minimal contribution of minor or moderate damage levels suggests that the assets were either systematically looted (as shown in the previous table) or subjected to destructive acts (like burning or total demolition), leaving the region's farming population without the fundamental means to resume cultivation and severely hindering any prospects for self-sustained recovery in the Households' agricultural economy.

Damage by Perpetrators

As indicated in Figure 3, the exact percentage share of the total damage is displayed above each bar, providing precise quantification alongside the visual comparison. The data reveals that the financial damage is overwhelmingly concentrated, with the top three groups ENDF,

EDF, and AMF responsible for over 97% of the total monetary toll. Specifically, the ENDF is the single largest contributor, accounting for 43.51% of the damage (US\$13.71 million). The EDF is the second major perpetrator at 33.59% (US\$10.58 Million), followed by the AMF at 20.09% (US\$6.33Million). This stark concentration of the financial burden underscores the necessity of focusing recovery and accountability efforts on the actions of these principal actors, as the remaining groups (IRF, AFF, EFP, and "other") contribute only a minimal share to the overall monetary impact. Furthermore, Figure 3 for monetary damage to crop tools, combined with the accompanying visual evidence, illustrate the perpetrators' deliberate brutality in destroying households' fundamental means of livelihood.

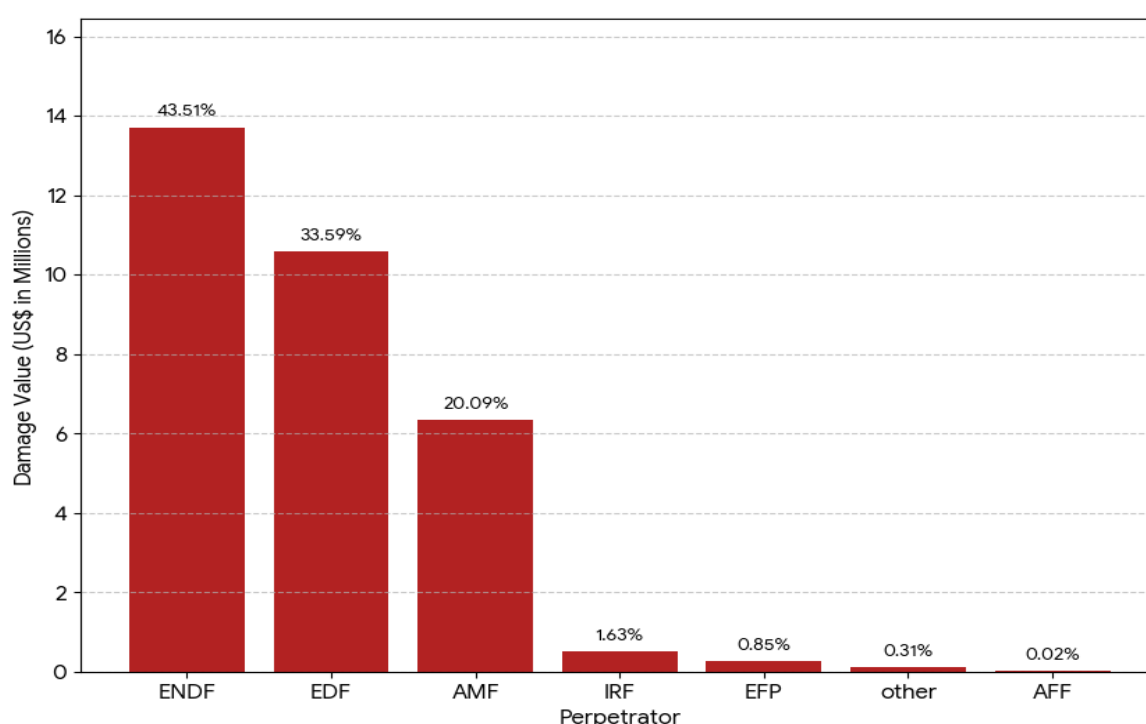


Figure 3: Damage Value by Perpetrators (US\$ in Millions)
Source: CITG Survey, 2022

Damage to Crop Input

Damage by item type

Table 24, detailing crop input damage from theft, burning, or destruction since November 2021, indicates a significant and widespread attack on agricultural production across 1,594 affected households, totalling US\$2.14 million in damage value.

The financial damage is heavily concentrated in essential, high-value inputs. Fertilizer/DAP represents the largest financial loss, accounting for 29.65% (US\$0.63 million) of the total damage, despite fewer households (132) reporting the loss compared to other inputs. Improved

seed is the second-highest contributor to the financial toll at 25.85% (US\$0.55 million), reported by the highest number of households (307).

Collectively, Fertilizer/DAP, Improved seed, and Fertilizer/Urea (16.19% share) represent over 71% of the total monetary damage. Local seed, while having the highest damaged quantity and frequency of reporting households (480), contributed only 14.37% to the total value, suggesting that the most technologically advanced and costly inputs were specifically targeted. Other inputs like fuel, seedlings, and various chemicals account for the remaining damage.

Table 24. Crop Input Damage Value in 2021/2022 (US\$ in Millions)

Crop input Categories	Number of respondents	Damaged Quantity	Damage value (US\$ in Millions)	Share (%)
Fertilizer/Urea	283	35646	0.35	16.19
Fertilizer/DAP	132	47997	0.63	29.65
Improved seed	307	83868	0.55	25.85
Local seed	480	100173	0.31	14.37
Seedlings	91	40314	0.09	4.17
Insecticides	75	12283	0.02	0.71
Herbicides	105	13882	0.01	0.65
Fuel	64	40145	0.17	7.74
Compost	57	3858	0.01	0.67
Total	1,594	378165	2.14	100.00

Source: CITG Survey ,2022

The destruction of these essential agricultural inputs has severe implications, primarily guaranteeing long-term food insecurity as the loss of improved seeds and fertilizers directly cripples households' ability to achieve high future yields, translating into a predictable decline in local food production. Consequently, the high monetary value of the damaged inputs, particularly DAP and Improved Seed, dictates an urgent need for high-value replacements, necessitating targeted, high-quality, and subsidized intervention instead of simple aid to effectively restore agricultural productivity. This deliberate and large-scale damage to crop inputs is viewed as a targeted strategy to undermine livelihoods, demonstrating a clear effort by perpetrators to erode the local economy and force affected communities into prolonged dependence on aid, making the restoration of agricultural self-sufficiency a complex and costly recovery process.

Damage type

According to Table 25 below, looting was the leading cause of damage to crop inputs, representing 35.07% of the total value (US\$0.75 million out of US\$2.14 million) and affecting 157,997 units. This was followed by stolen inputs at 28.37% (US\$0.61 million, 70,992 units), burned inputs at 21.58% (US\$0.46 million, 91,533 units), and missing inputs at 14.97% (US\$0.32 million, 57,643 units). Collectively, looting and theft accounted for over 63% of the

total damage value, indicating a predominant pattern of deliberate asset removal and destruction

Table 25. Damage to Crop Inputs by Damage Type (US\$ in Millions)

Damage Type	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Burned	91533	0.46	21.58
Looted	157997	0.75	35.07
Missing	57643	0.32	14.97
Stolen	70992	0.61	28.37
Total		2.14	100.00

Source: CITG Survey, 2022

Damage Severity Level

Based on Table 26, an overwhelming 96.02% of the total damage value (US\$2.05 million out of US\$2.14 million) resulted from complete damage, impacting 360,126 units—signaling near-total annihilation of crop inputs. Severe damage contributed only 3.27% (US\$0.07 million, 8,684 units), while moderate and minor damage were negligible at 0.07% and 0.64%, respectively. This extreme skew toward complete destruction underscores the systematic and irreversible nature of the assault on Tigray’s agricultural livelihood foundation.

Table 26. Damage to Crop Inputs by Damage Severity Level (US\$ in millions)

Damage Severity Level	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Minor Damage	5089	0.01	0.64
Moderate Damage	4267	0.00	0.07
Sever Damage	8684	0.07	3.27
Complete Damage	360126	2.05	96.02
Total	378165	2.14	100.00

Source: CITG Survey, 2022

Damage by Perpetrators

Table 27 demonstrates that the responsibility for the US\$2.14 million in crop input damage is overwhelmingly concentrated among the top three actors: ENDF, EDF, and AMF, who collectively account for 95.85% of the total monetary toll. The ENDF is the principal perpetrator, responsible for 50.50% (\$1.08 million) of the damage, followed by the EDF at 31.14% (US\$0.67 million) and the AMF at 14.21% (US\$0.30 million). This concentration holds true across nearly all input categories, particularly the most financially damaging ones like Fertilizer/DAP and Improved Seed, where the ENDF consistently causes the highest loss. Minor actors (EFP, IRF, AFF, and "other") contribute a marginal share, reinforcing the conclusion that accountability must be directed toward the actions of the three principal groups. This severe concentration of damage by a few principal actors serves as a critical indicator of a strategic campaign of economic destruction rather than sporadic violence. The majority of the damage is inflicted upon high-value, high-impact inputs like fertilizers and improved seeds,

suggesting a deliberate, targeted effort to undermine long-term agricultural recovery and food security in the region. Specifically, the ENDF's role as the majority contributor across all essential crop categories implies, they had the greatest impact on the current and future productivity of affected households. Therefore, the success of any recovery effort is directly tied to a mechanism that holds these specific groups accountable and provides targeted replacement of the most damaged, high-value commodities, as the scale and concentration of the losses guarantee sustained food insecurity without focused intervention.

Table 27. Crop Input Damage by Perpetrators in 2021/2022 (US\$ in Millions)

Damaged Crop farm Input categories	Perpetrators of agricultural inputs since Nov.2021(US\$ in Millions)							Total
	ENDF	EFP	EDF	AMF	IRF	AFF	other	
Fertilizer/Urea	0.18	0.00	0.12	0.04	0.00	0.00	0.00	0.35
fertilizer/dap	0.30	0.00	0.19	0.11	0.03	0.00	0.00	0.63
Improved seed	0.29	0.01	0.17	0.07	0.01	0.01	0.00	0.55
Local seed	0.17	0.00	0.10	0.03	0.00	0.00	0.00	0.31
Seedlings	0.05	0.00	0.03	0.01	0.00	0.00	0.00	0.09
Insecticides	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Herbicides	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Fuel	0.07	0.01	0.05	0.04	0.01	0.00	0.00	0.17
Compost	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Total	1.08	0.02	0.67	0.30	0.05	0.01	0.01	2.14
Share	50.50	1.11	31.14	14.21	2.39	0.37	0.29	100.00

Source: CITG Survey, 2022

Damage to Domestic Animal – Live Animals

Damage by item type

A total of 55.14% of the assessed households (i.e., 362,493/657,360) reported animal damage as a result of the war. As indicated in Table 28 above, the war in Tigray resulted in catastrophic losses of animal resources for smallholder households in 2021/2022, totalling an estimated monetary value of US\$57.07 million from 691,346 damaged animals across 70,408 households. The data reveals that goats incurred the most substantial damage cost at US\$29.61 million (51.89% of the total), reflecting the highest number of damaged animals (163,029) and the largest number of affected households (16,542). Cattle followed with the second-highest damage value of \$15.00 million (26.29%), despite having a lower quantity damaged (42,447), indicating their high individual economic value. Sheep and poultry also suffered significant damage, with costs of US\$5.04 million (8.83%) for sheep and US\$4.75 million (8.33%) for poultry, the latter affecting the greatest number of households (25,644) and animals (365,707). Less significant, yet still impactful, losses were recorded for equines at US\$1.92 million (3.37%), bee colonies at US\$0.55 million (0.96%), pet animals at US\$0.12 million (0.21%), and negligible amounts for camels (US\$0.04 million) and fish (US\$0.00 million).

Table 28. Animal Damage Value in 2021/2022 by Animal Species (US\$ in Millions)

Categories	Household frequency	Quantity Damaged	Damage Value (US\$ in Millions)	Share (%)
Cattle	8,603	42,447	15.00	26.29
Sheep	8,880	97,317	5.04	8.83
Goat	16,542	163,029	29.61	51.89
Poultry	25,644	365,707	4.75	8.33
Camel	42	71	0.04	0.06
Equines	5,333	23,094	1.92	3.37
Pet	4,138	27,175	0.12	0.21
Fish	3	207	0.00	0.00
Bee colony	1,221	8,144	0.55	0.96
Total	70,408	691,346	57.07	100.00

Source: CITG Survey, 2022

As stated in Table 28 above, the sheer scale of animal loss has profound implications for the people of Tigray. The destroyed animals represent the mainstay of the smallholder households' livelihood, as the region's agriculture heavily relies on animal draught power for cultivation. This massive depletion of resources signifies a severe blow to food security and economic stability, fundamentally dismantling the conditions of life for the agricultural population. A critical difficulty is that these animals are not easily replaceable, making large-scale, high-level animal restocking programs essential to recovery. Given the central role of these animals in the local economy and survival, the documented extensive and systemic damage strongly suggests a deliberate campaign aimed at severely harming and dehumanizing the people of Tigray by denying them the very basis of their existence.

Damage Type

Table 29 shows the distribution of households affected by different types of animal damage in the 2021/2022 reference year. Looting was the most common, making up 37.36% of all reported cases. It was followed by slaughtering (24.18%), disease (14.23%), and missing animals (11.84%). These four categories together account for 82.11% of all animal losses reported, highlighting the extensive impact of war-related disruptions on household animal assets. The high incidence of looting and slaughtering indicates both opportunistic theft of assets and forced consumption during the war period.

Table 29. Distribution of Animal Type by Damage Type in 2021/2022 (in Quantity & Percentage)

Animal Category	Frequency and percentage of Respondents by Animal damage								Total
	Killing	Slaughtering	Looting	Burning	Missing	Diseases	Injury	Other	
Cattle	876	929	4250	12	712	1401	155	268	8603
Share (%)	10.18	10.80	49.40	0.14	8.28	16.29	1.80	3.12	100.00
Sheep	823	2,296	2,403	27	1,308	1,783	39	201	8880
Share (%)	9.27	25.86	27.06	0.30	14.73	20.08	0.44	2.26	100.00
Goat	1024	5393	5355	23	1975	2523	80	169	16542
Share (%)	6.19	32.60	32.37	0.14	11.94	15.25	0.48	1.02	100.00
Poultry	1983	7284	10103	138	2551	2901	246	440	25646
Share (%)	7.73	28.40	39.39	0.54	9.95	11.31	0.96	1.72	100.00
Camel	9	1	22	0	6	4	0	0	42
Share (%)	21.43	2.38	52.38	0.00	14.29	9.52	0.00	0.00	100.00

Animal Category	Frequency and percentage of Respondents by Animal damage								Total
	Killing	Slaughtering	Looting	Burning	Missing	Diseases	Injury	Other	
Equines	900	487	2446	18	634	677	65	106	5333
Share (%)	16.88	9.13	45.87	0.34	11.89	12.69	1.22	1.99	100.00
Pet	497	625	1623	14	448	726	82	123	4138
Share (%)	12.01	15.10	39.22	0.34	10.83	17.54	1.98	2.97	100.00
Fish	0	1	2	0	0	0	0	0	3
Share (%)	0.00	33.33	66.67	0.00	0.00	0.00	0.00	0.00	100.00
Bee col.	32	7	102	320	701	7	24	28	1221
Share (%)	2.62	0.57	8.35	26.21	57.41	0.57	1.97	2.29	100.00
Total_HH	6144	17023	26306	552	8335	10022	691	1335	70408
Share (%)	8.73	24.18	37.36	0.78	11.84	14.23	0.98	1.90	100.00

Source: CITG Survey, 2022

The data also highlights distinct vulnerability profiles among different species. Cattle were mainly impacted by looting (49.40%), followed by slaughtering (10.80%) and killing (10.18%), due to their high economic and symbolic importance. Sheep faced significant slaughtering (25.86%) and looting (27.06%), along with increased disease cases (20.08%). Goats showed similar levels of looting (32.37%) and slaughtering (32.60%), with a notable disease burden (15.25%). Poultry were disproportionately targeted by looting (39.39%) and slaughtering (28.40%). Equines were heavily looted (45.87%) and also killed (16.88%), while Pets mainly experienced looting (39.22%). Camels, though fewer in number, were primarily looted (52.38%) and killed (21.43%), indicating strategic targeting. Bee colonies were uniquely affected by burning (26.21%) and cases of missing colonies (57.41%), showing their vulnerability to fire and displacement.

The widespread looting and slaughter across various species highlight urgent needs for restocking animal populations, safeguarding assets, and restoring livelihoods. Losses caused by diseases indicate a failure in veterinary services and biosecurity measures, emphasizing the importance of mobile health clinics and community surveillance. The high number of missing animals, especially among bee colonies, points to the necessity of implementing traceability systems and conducting post-war asset mapping. Additionally, the deliberate killing of equines and camels—vital for transportation and mobility—appears to be a targeted effort to weaken household resilience mechanisms.

Damage by Perpetrators

As indicated in Table 30 ,the total animal damage reported in 2021/2022 amounted to US\$57.03 million. The damage is heavily concentrated, with goats and cattle being the primary perpetrators, accounting for US\$29.61 million (51.92% of the total) and US\$15.00 million (26.30% of the total), respectively. Together, these two animal types are responsible for over three-quarters of the total animal damage. On the perpetrator category side, ENDF (US\$22.16 million, or 38.85% of the total) and EDF (US\$21.92 million, or 38.43% of the total) are the

leading sources of damage, collectively making up over 77% of the entire reported damage. Specifically, the high damage attributed to goats is split between these two main categories, with \$11.33 million in ENDF and \$12.50 million in EDF. Other animal types like sheep (US\$5.04 million), poultry (US\$4.75 million), and equines (\$1.92 million) contribute smaller but still notable portions of the damage, while animals such as camels, pets, and fish account for negligible amounts.

Table 30. Animal Damage by Perpetrators of Animal Type (US\$ in Millions)

Category	Perpetrators							Total
	ENDF	EFP	EDF	AMF	IRF	AFF	Others	
Cattle	5.82	0.14	4.52	2.99	0.32	0.03	1.18	15.00
Sheep	1.98	0.05	2.04	0.39	0.08	0.01	0.49	5.04
Goat	11.33	0.33	12.50	3.18	0.44	0.03	1.80	29.61
Poultry	1.96	0.05	1.83	0.58	0.07	0.01	0.25	4.75
Camel	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.04
Equines	0.74	0.02	0.72	0.26	0.04	0.01	0.14	1.92
Pet	0.05	0.00	0.04	0.02	0.00	0.00	0.01	0.12
Fish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bee colony	0.26	0.00	0.25	0.01	0.00	0.00	0.01	0.55
Total	22.16	0.59	21.92	7.44	0.95	0.09	3.88	57.03
Share (%)	38.85	1.03	38.43	13.05	1.67	0.16	6.81	100.00

Source: CITG Survey, 2022



Source: CITG Documentation Office, 2022

The result strongly implies that any effective damage mitigation strategy must prioritize the goat population and target the underlying factors responsible for the high damage in the ENDF and EDF categories. Given that goats alone account for more than half of the total damage, and their damage is almost equally split between ENDF and EDF, intervention efforts focused on goat management within these two primary damage contexts could yield the most significant reduction in overall reported losses. Furthermore, since cattle represent the second-largest perpetrator, a secondary focus on their management would also be essential for a comprehensive damage reduction plan.

In addition to the direct perpetration, domestic animals are also largely affected animal diseases and faced death due to veterinary service disruptions. The financial loss due to animal illness or death amounts to \$0.3534 million. This financial loss is derived from a substantial number of affected animals, totaling 350,774 (a near-equal split of 177,633 sick and 173,141 dead animals), as reported by 28,827 respondents. The high volume of reported cases across a large number of respondents suggests that the harm to livestock was widespread and affected a significant portion of the civilian population. While the total dollar value is relatively modest, the sheer number of affected animals over 350,000 represents a profound loss of capital and livelihood in an agrarian setting. This depletion of animal assets severely impacts local food security, reduces essential agricultural resources like draft power, and directly diminishes the wealth of thousands of households, compounding the overall socio-economic crisis.

Damage to Veterinary Medical Supplies

Damage by item type

The preservation of animal life, particularly in times of war, relies heavily on accessible health infrastructure, including medical resources and supplies. Our assessment of this sector indicates a devastating financial loss attributed to the destruction of these crucial assets. Specifically, the damage value associated with household animal related medical resources (including equipment and essential supplies) amounts to a substantial \$93.00 million. This significant figure highlights not only the destruction of physical assets but also a severe blow to the capacity of local communities to treat and manage animal diseases, which directly undermines ongoing efforts to stabilize livestock health and protect rural livelihoods.

Damage Type

A total of 4,425 households reported about 3.6 million veterinary medical supplies and equipment, and their monetary value was estimated at US\$93.00 million (Table 31).

Table 31. Damage to Veterinary Medical Equipment by Damage Type (US\$ in Millions)

Damage Type	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Burned	132248	2.93	3.14
Destroyed	1350146	44.00	47.21
Looted ³	1483819	31.95	34.28
Missed	110384	2.32	2.49
Other	15739	0.26	0.28
Stolen	481775	11.74	12.60
Total		93.20	100.00

³Looted – refers to stealing items under conditions of crisis or war.

Stolen – refers to the unlawful taking of another's property without permission by force.

According to Table 31, the veterinary medical infrastructure suffered devastating losses totaling US\$93.20 million. Destruction was the dominant damage type, accounting for 47.21% of the total value (US\$44.00 million) and affecting 1,350,146 units, indicating widespread physical obliteration of critical equipment. Looting followed closely at 34.28% (US\$31.95 million, 1,483,819 units), while stolen equipment contributed 12.60% (US\$11.74 million, 481,775 units). Together, looting and theft comprised 46.88% of the damage value, pointing to systematic plunder. Burned equipment represented 3.14% (US\$2.93 million, 132,248 units), missed items 2.49% (US\$2.32 million, 110,384 units), and other forms of damage a negligible 0.28% (US\$0.26 million). The combined impact of destruction, looting, and theft exceeding 94% of total losses reveals a deliberate, multi-pronged assault aimed at dismantling Tigray's veterinary healthcare system, severely undermining animal health services and agricultural productivity.

Damage Severity Level

According to Table 32, the destruction was overwhelmingly absolute, with complete damage dominating at 96.82% of the total value (US\$90.24 million out of US\$93.20 million), affecting 3,392,452 units. This near-total obliteration indicates that the vast majority of veterinary medical equipment was rendered entirely unusable, leaving minimal prospects for salvage or repair. Severe damage accounted for only 2.10% (US\$1.96 million, 139,561 units), while moderate and minor damage were negligible at 0.53% (US\$0.50 million) and 0.55% (US\$0.51 million), respectively. The extreme concentration of losses in the complete damage category—over 96% of the total confirms a systematic, intentional effort to eradicate Tigray's veterinary healthcare infrastructure, severely compromising animal disease control, treatment capabilities, and the sustainability of the livestock sector.

Table 32. Damage to Veterinary Medical Equipment by Damage Severity Level (US\$ in Millions)

Damage Severity Level	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Minor Damage	25392	0.51	0.55
Moderate Damage	16709	0.50	0.53
Sever Damage	139561	1.96	2.10
Complete Damage	3392452	90.24	96.82
Total	3574115	93.20	100.00

Source: CITG Survey, 2022

Damage by Perpetrator

Table 33, the Ethiopian National Defense Force (ENDF) was the primary perpetrator, responsible for 55.85% of the total damage value (US\$52.05 million) and affecting 2,128,964 units. The Eritrean Defense Forces (EDF) ranked second, causing 40.28% of the damage (US\$37.54 million, 1,278,915 units). Together, ENDF and EDF accounted for 96.13% of the total destruction, demonstrating their central role in the systematic dismantling of veterinary facilities. Amhara Forces (AMF) contributed 2.44% (US\$2.28 million), while Afar Forces (AFF), Ethiopian Federal Police (EFP), Irregular Forces (IRF), and other actors played minimal roles at 0.52%, 0.34%, 0.57%, and 0.01%, respectively. This distribution clearly identifies ENDF and EDF as the dominant forces behind the deliberate and large-scale targeting of veterinary medical assets, underscoring a coordinated assault on Tigray's agricultural resilience.

Table 33. Damage to Veterinary Medical Equipment by Damage of Perpetrators (US\$ in Millions)

Perpetrators	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
AMF	63,376	2.28	2.44
AFF	708	0.48	0.52
EDF	1,278,915	37.54	40.28
ENDF	2,128,964	52.05	55.85
IRF	13,522	0.53	0.57
EFP	73,933	0.31	0.34
Other	14,694	0.01	0.01
Total		93.20	100.00

Source: CITG Survey, 2022

Damage to Animal Input and Feeds

Damage by item type

The war resulted in significant material losses for animal husbandry, directly impacting the ability of households to sustain their livestock. According to the assessment, 4,830 households reported substantial damage to essential farming resources. The cumulative loss includes approximately 200,045 units (quantity) of various livestock inputs and feeds. The total monetary value of this damaged feed and input material is estimated to be US\$11.131 million. This damage value represents a critical blow to agricultural productivity, as the destruction of animal feed and necessary inputs severely restricts livestock health and production capabilities for thousands of affected households (Table 34).

Damage Type

Table 34 shows how the total financial damage of \$11.13 million to animal inputs and feed is distributed based on the action that caused the loss. Destruction stands as the primary cause, accounting for \$8.02 million, a staggering 72.08% of the total damage value indicating that the majority of losses resulted from deliberate or collateral physical obliteration of critical livestock resources. Looting ranks second, contributing \$2.06 million (18.46%), reflecting systematic plunder of feed and inputs. Burning and missing items represent minor shares at 6.79% and 2.67%, respectively, underscoring that partial or incidental losses were far less prevalent than outright destruction.

Table 34. Damage to Animal Input and Feed by Damage Type (US\$ in Millions)

Damage Type	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Burning	9095	0.76	6.79
Destruction	143560	8.02	72.08
Looting	44961	2.06	18.46
Missing	2428	0.30	2.67
Total		11.13	100.00

Source: CITG Survey, 2022

Damage Severity Level

Table 35 examines the extent of damage that led to the total loss of \$11.13 million in animal inputs and feed. The data reveals an extreme pattern: complete damage dominates, totaling \$10.59 million 95.10% of the overall value, meaning that when inputs and feed were affected, they were almost entirely rendered unusable or irretrievable. Severe damage accounts for a minimal \$0.50 million (4.48%), while minor and moderate damage categories are virtually negligible. This near-universal incidence of complete loss confirms that the assault on animal inputs was not incremental but total, leaving little to no salvageable material for recovery.

Table 35. Damage to Animal Input and Feed by Damage Severity Level (US\$ in Millions)

Damage Severity Level	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Minor Damage	329	0.03	0.28
Moderate Damage	108	0.02	0.14
Sever Damage	11,808	0.50	4.48
Complete Damage	187,799	10.59	95.10
Grand Total		11.13	100.00

Source: CITG Survey, 2022

Damage by Perpetrators

Table 36 identifies the entities responsible for the \$11.13 million in damage to animal inputs and feed. Two groups, EDF and ENDF, are overwhelmingly culpable, together accounting for

over 91% of the destruction. The Eritrean Defense Forces (EDF) emerge as the single largest perpetrator, inflicting \$5.57 million in damage (50.07%), followed closely by the Ethiopian National Defense Force (ENDF) at \$4.60 million (41.29%). The remaining actors, IRF, AMF, AFF, EFP, and others collectively contribute less than 9%, highlighting the concentrated role of EDF and ENDF in the systematic targeting and annihilation of livestock support systems.

Table 36. Damage to Animal Input and Feed by Damage of Perpetrators (US\$ in Millions)

Perpetrators	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
AMF	248	0.04	0.33
AFF	547	0.07	0.64
EDF	65543	5.57	50.07
ENDF	114454	4.60	41.29
IRF	9086	0.31	2.78
EFP	526	0.07	0.65
Other	9640	0.47	4.24
Total		11.13	100.00

Source: CITG Survey, 2022

Damage to Livestock Production Assets and Farm Infrastructure

Damage by item type

Table 37 shows the quantity and damage value of animal tools or equipment in the year 2021/2022. The table lists various types of tools, such as barns, fattening tools, dairy tools, poultry tools, apiculture tools, fodder tools, silk culture tools, generators, cold chain, seed, farm car, motorcycle, bicycle, tractor, animal track, farm computer, printer, chair, table, shelf, and miscellaneous. According to the table, the highest frequency of tools is barns or sheds, with 846 households reporting 16,410 damaged quantities worth 3.304 million US\$. The second-highest frequency is apiculture tools, with 167 households reporting 1,261 damaged quantities worth 1.601 million US\$. The lowest frequency is silk culture tools, with only two households reporting six damaged quantities worth 0.0053 million US\$. The total number of households reporting damaged tools is 2,245, with a total quantity of 965,841 items damaged and a total damage value of \$ 8.73 million.

Table 37. Quantity and Damage Value of Animal Tool in 2021/2022 (US\$ in Millions)

Type of tool	No. of HH	Damaged quantity	Damage value (US\$ in Millions)	Share (%)
Barn (Shed)	846	16,410	3.30	37.85
Fattening tools	121	3,960	0.11	1.31
Dairy farm tools	31	88	0.02	0.25
Poultry farm tools	168	499	0.35	4.05
Apiculture farm tools	167	1,261	1.60	18.34
Fodder	55	842	0.04	0.46
Silk culture tool	2	6	0.01	0.06
Generators	111	246	0.67	7.63
Cold chain	44	106	0.05	0.58

Type of tool	No. of HH	Damaged quantity	Damage value (US\$ in Millions)	Share (%)
Seed	69	202	0.18	2.06
Car	26	42	0.63	7.21
Motorcycle	18	29	0.08	0.92
Bicycle	33	36	0.01	0.11
Tractor	8	19	0.55	6.32
Track	29	62	0.02	0.22
Computer	13	28	0.03	0.35
Laptop	22	32	0.09	1.04
Printer	4	5	0.01	0.12
Chair	141	1,602	0.04	0.48
Table	52	596	0.02	0.26
Shelf	13	86	0.00	0.05
Miscellaneous	270	939,684	0.89	10.24
Total (US\$)	2,245	965,841	8.73	100.00

Source: CITG Survey, 2022

Damage Type

Based on Table 38, damage to the value of animal tools reveals that looting and burning were the most financially damaging types. Looted items accounted for the largest share of the total damage value, at 39.73% (US\$3.47 million), despite 'Missing' items having a higher quantity damaged (389,296 looted versus 489,613 missing). Damage from burning was the second most significant, representing 35.20% (US\$3.07 million) of the total damage value. In comparison, 'Missing' items, while having the highest quantity damaged, contributed only 11.58% (US\$1.01 million) to the total value loss, suggesting that the missing tools were generally lower in value than those looted or burned. Damage categorized as 'Broken' represented a moderate 12.88% (US\$1.12 million), while 'Other' damage was negligible, contributing only 0.62% (US\$0.05 million) to the grand total damage value of US\$8.73 million.

Table 38. Damage Value of Animal Tool by Damage Type (US\$ in Millions)

Damage Type	Quantity Damaged	Damage value (US\$ in Millions)	Share (%)
Broken	10526	1.12	12.88
Burned	42219	3.07	35.20
Looted	389296	3.47	39.73
Missing	489613	1.01	11.58
Other	12704	0.05	0.62
Grand Total		8.73	100.00

Source: CITG Survey, 2022

Damage Severity Level

According to Table 39, the severity analysis clearly indicates that the overwhelming majority of the damage value to animal tools resulted from Complete Damage, which accounted for a massive 88.00% (US\$7.68 million) of the total loss. This level of damage, despite involving 891,660 damaged items, highlights that the highest-value damage resulted in the total destruction or complete loss of function of the tools. In sharp contrast, all other severity levels,

Minor Damage, Moderate Damage, and Severe Damage, contributed relatively small shares to the total value loss. 'Severe Damage' accounted for only 6.12% (US\$0.53 million), 'Moderate Damage' for 3.62% (US\$0.32 million), and 'Minor Damage' for the smallest share at just 2.26% (US\$0.20 million). This stark distribution underscores that the loss of animal tool value was dominated by incidents of total asset destruction.

Table 39. Damage Value of Animal Tool by Damage Severity Level (US\$ in Millions)

Damage Severity Level	Quantity Damaged	Damage value (US\$ in Millions)	Share (%)
Minor Damage	12800	0.20	2.26
Moderate Damage	354	0.32	3.62
Sever Damage	39544	0.53	6.12
Complete Damage	891660	7.68	88.00
Total		8.73	100.00

Source: CITG Survey, 2022

Damage by Perpetrators

As indicated in Table 40, the damage to the value of animal tools is overwhelmingly attributed to the ENDF and the EDF. The ENDF (Ethiopian National Defence Force) is recorded as the perpetrator responsible for the largest portion of the total damage value, at 53.06% (US\$4.63 million), having damaged 233,364 units. Closely following is the EDF (Eritrean Defence Force), which accounted for 39.51% (US\$3.45 million) of the total value loss. Together, these two entities are responsible for nearly 92.57% of the total US\$8.73 million damage value. The contributions of the other listed perpetrators, AMF (5.64% or US\$0.49 million), AFF (0.19%), IRF (0.62%), EFP (0.75%), and Other (0.24%) were comparatively minor, indicating a high concentration of the financial impact of damage within the actions attributed to the ENDF and the EDF.

Table 40. Damage Value of Animal Tool by Perpetrators (US\$ in Millions)

Perpetrators	Quantity Damaged	Damage value (US\$ in Millions)	Share (%)
AMF	289622	0.49	5.64
AFF	25	0.02	0.19
EDF	402753	3.45	39.51
ENDF	233364	4.63	53.06
IRF	3242	0.05	0.62
EFP	5701	0.07	0.75
Other	9651	0.02	0.24
Total	944358	8.73	100.00

Source: CITG Survey, 2022

Loss by category

Physical destruction of the household sector and the complete siege seriously affect the production capacity of the sector. Once we get pre-war and post-war asset destruction, crop

and livestock production loss information. We estimate the loss value of crop production, livestock production, and service operations. While the monetary value of full damage is expressed in terms of replacement or reconstruction costs, using pre-war prevailing price information from 2020. The monetary value of losses is expressed in current price values (Jovel & Mudahar, 2010). A local but current producer's gate price was used to estimate the value of agricultural production losses caused by either war damage or a complete siege. While revenue loss is calculated in the case of service in this case.

For rationality purposes, we use the pre-war three-year production capacity of each household and take the average of the three years' production volume. The war and siege period production volume of the households was also captured from the survey. The difference between the respective year production volume and the average of the pre-war three years' production volume gives the extent of production reduction due to the war and siege. The damage-related production loss was estimated only in the harvesting years of 2021 and 2022, and this accounted for the effect of damage and full siege. The data show that the production capacity of the household sector in 2021- 2022 was almost null. This is due to the destruction of means of production and facilities of the firms, and the economic infrastructure. The following two sections exhibit the amount of production loss for crop and livestock.

Crop Loss

In this subsection, the team tried to present the crop production loss value obtained from cereal, vegetable, pulses, oilseed, fruits, and cash crop trees. The agricultural production, mainly crops, fruit, pulse, oilseed, and vegetable production damage information we got from the pre-war and post-war harvesting periods was used to compare the household sector's performance and to calculate the reduction or interruption in production in the case of the agriculture sector. The agricultural crop production loss is mainly caused by unharvested crops; uncultivated land due to the loss of inputs such as seed, draught power oxen, feed, and labour; crop loss in the field, crop loss in the threshing centre, and crop loss in the store. The following tables exhibit the amount of production loss for agricultural crop production. Therefore, the crop loss mainly consists of the broad categories of loss, such as unharvested crop loss, uncultivated crop loss, threshing crop loss, and crop loss in storage.

Based on the estimation (Table 41), the household experienced a grain production loss of US\$87 million, followed by the residue production loss of US\$5.8 million due to the crop remaining unharvested in the harvesting years of 2021 and 2022, respectively. This loss

happened because of a lack of input, oxen, and security. Moreover, farmers were displaced, denied access to their farmland, and breadwinners were killed, injured, or missing and joined the resistance struggle. From Table 48, it is clear that a total of 31,007.6 hectares (124,030.40 tsimad) caused a grain production loss of 597,638 quintal and residue loss of 606,208.95 donkey loads. While the rain-fed crop production loss constituted 76 million as grain loss and US\$5.3 million as residue loss, the irrigation crop production loss amounted to US\$11 million for grain and US\$0.5 million for residue in the harvesting years of 2021/22. Overall, the crop loss amounted to US\$92.8 million.

Table 41. Unharvested Crop Loss Value in 2021/2022 (US\$ in Millions)

Categories	2021/22	Unharvested Land in Tsimdi	Lost harvest in quintal	Lost residue in DL ⁴	Crop Loss (US\$ in Millions)	Residue loss (US\$ in Millions)
Rain fed	Vegetable	3450.4	51204.17	20627.46	7.24	0
	Root ⁵	10.5	225	123	0.02	0
	Cereal	29221.5	134776.7	170317.3	21.38	1.802
	Pulses	560.8	2147.6	3467.15	0.38	0.0184
	Oilseed	11382.6	32926.96	27674.49	4.06	0.196
	Sub-Total	45016	226957	223811	33.09	2.017
	2020/21					
	Vegetable	2229.95	33559.49	8204.9	4.73	0.000
	Root	25	566	12	0.06	0.000
	Cereal	44176.3	194751.9	278489.2	30.92	2.951
	Pulses	484.5	1092.19	1835.25	0.19	0.010
	Oilseed	19570.05	56133.87	44585.49	6.94	0.314
	Sub-Total	67344	293931	334635	42.85	3.28
	2022					
Irrigated	Cereal	3412.1	12376.61	14951.61	1.96	0.158
	Pulses	298.7	933.61	1112.5	0.16	0.006
	oilseed	706.9	1951.5	1146	0.24	0.008
	Sub-Total	4884.7	19175	18184	2.37	0.172
	2021					
	Cereal	5263	50664.49	24369.45	8.06	0.256
	Pulses	184.6	210	298	0.04	0.002
	oilseed	1116	4108	4242	0.51	0.030
	Sub-Total	6785.7	57575	29578.95	8.60	0.288
Grand-Total		124,030.40	597,638.00	606,208.95	87.00	5.8

Source: CITG Survey, 2022

Moreover, based on the loss estimation from uncultivated land in Table 42, the total grain loss incurred by the household sector is approximately US\$32.1 million, and the residue's production loss is estimated to be US\$2.333 million. Hence, the sector lost a total amount of US\$34.4 million that would be earned if these households were fully functioning in the

⁴ Donkey Load

⁵ Root

harvesting years of 2021 and 2022. This gives a total loss of US\$34.433 million in the two consecutive harvesting years. However, the team is aware that the production loss for the year 2023 harvesting year is not accounted for in this assessment, although the damage has not yet been restored and compensated. If this value were included, the team would believe that the value of total loss in this sector would go higher. You can quickly infer that the sector had a total of 13,225.7 hectares (52,902.8 tsimad) with a respective total loss of 220,057 quintal of grain and 244,656 donkey loads of residue.

Table 42. Uncultivated Crop Loss Value in 2021/2022 (US\$ in Millions)

Categories	Year_2021/22	Land in Tsimdi	Lost harvest In quintal	Lost residue in DL	Crop Loss (US\$ in Millions)	Residue loss (US\$ in Millions)
Rain fed	Vegetable	1301.1	14418.04	5602.7	2.03	0
	Root	12.5	108	74	0.01	0
	Cereal	11905.95	53482.76	75631.51	8.50	0.802
	Pulses	132.7	807.53	669.5	0.14	0.004
	Oilseed	6637.6	18550.09	13110.49	2.30	0.093
	Sub-Total	20213	90146	95226	12.98	0.898
	2020/21					
	Vegetable	974.4	9040.65	4746	1.28	0.000
	Root	6	61.5	113	0.01	0.000
	Cereal	16820.9	70911.57	103720.5	11.27	1.099
	Pulses	126.1	201.95	467.5	0.04	0.002
	Oilseed	10288.2	27943.15	22903.5	3.46	0.162
	Sub-Total	28426	109305	131,950.50	16.05	1.263
	2022					
Irrigated	cereal	1503.8	6501.14	8353.25	1.03	0.089
	pulses	19.9	47	26	0.01	0.0001
	oilseed	331.1	1186.1	875	0.15	0.006
	Sub-Total	2031.8	8423.7	9254.25	1.19	0.095
	2021					
	cereal	1601	10120.68	6740.5	1.61	0.071
	pulses	54	115.5	101.5	0.02	0.001
	oilseed	524	1584	583	0.20	0.004
	Sub-Total	2232	12182	7425	1.83	0.076
Grand Total		52,902.8	220,057	244,656	32.1	2.333

Source: CITG Survey, 2022

Based on Table 43, the team further collected the sector's harvest quantity lost in the crop field and its respective local gate price for every crop category for the years 2021 and 2022 against the baseline years of 2017, 2018, and 2019. Table 50 displayed the monetary loss value. Total losses of grain and residue due to the damaged field crop equal US\$43.66 million and US\$2.91 million, and this is generated mainly from the opportunity cost of interrupted crop production due to the war. Table 43 reveals that, on aggregate, the total damage loss in 2021 and 2022 was estimated to be a monetary value of US\$46.57 million, resulting from the crop harvest damage of 130,574q of grain and 127,720 donkey loads of residue in the field. Therefore, the overall

damage and loss result indicates that the household sector entirely collapsed due to the devastating action of the intruders in the Tigray war.

Table 43. Field Crop Loss Value in 2021/2022 (US\$ in Millions)

Field crop	2021/22	Land in tsimdi	Lost harvest In quintal	Lost residue In DL	Crop Loss (US\$ in Millions)	Residue loss (US\$ in Millions)
Rain fed	Vegetable	1267	13128.2	3958.55	1.86	-
	Root	12	33.2	70.5	0.004	-
	Cereal	9679	43192.55	60838.2	6.87	0.64
	Pulses	234	811.7	599.9	0.14	0.003
	Oilseed	3961	12030.6	9149.6	1.49	0.06
	Sub-total	15471	71898	75171	10.36	0.71
2020/21						
Rain fed	Vegetable	350.65	7161.1	2315.95	1.39	-
	Root	.2	6	12	0.001	-
	Cereal	5357.5	24950.37	32792	26.50	1.91
	Pulses	53.3	215.14	307.5	0.04	0.002
	Oilseed	2409	7690	6901	1.17	0.09
	Sub-total	8248	40315	42548	29.10	2.00
Irrigated	2022					
	cereal	1081.4	5551.95	3910.5	0.86	0.06
	pulses	65.2	41	71	0.01	0.0003
	oilseed	213.5	649.3	261	0.08	0.0018
	Sub-total	1468	7286	4586	0.95	0.07
Irrigated	2021					
	cereal	1845	8216.8	4778.6	3.04	0.12
	pulses	36.4	482.5	112.5	0.09	0.001
	oilseed	298	975	249	0.12	0.002
	Sub-Total	2219	11075	5415	3.24	0.13
Grand Total		27406	130574	127720	43.66	2.91

Source: CITG Survey, 2022

In the same manner, the team estimated a loss of crop harvest in the threshing site. There has been a number of evidence that crop grain and residue were burned down in the threshing site while it was in the form of a heap. It gives a total grain production loss of US\$ 23.83 million and residue production loss of US\$ 849.03 million in the consecutive two harvesting years of 2021 and 2022. As indicated in the table, the higher share (93.78%) of the loss accounted by the grain loss of damaged crop in the threshing centre followed by the residue loss value of 6.22 percent incurred due to intentional burning of crops giving a total loss of out of total loss US\$ 872.9 million in this sector. The team, indeed, believes that the loss is increasing from time to time; if a loss of 2023 is added and its loss value will be completely changed. It is important to note that this loss comes as a result of 81,467q of grain and 102,440 donkey load residue damage in the threshing site.

Table 44. Threshing Site Crop Loss Value in 2021/2022 (US\$ in Millions)

Categories	2021/22	Lost harvest In quintal	Lost residue In DL	Crop Loss (US\$ in Millions)	Residue loss (US\$ in Millions)
Rain fed	Vegetable	2834.77	2171.3	0.39	-
	Root	1	2	0.00	-
	Cereal	22056.76	33562.81	10.88	848.06
	Pulses	182.31	384.95	0.03	0.00
	Oilseed	6605.24	6009.5	0.91	0.08
	Sub-total	32290	42609	12.21	848.14
	2020/21				
	Vegetable	1966.03	1464.15	0.27	-
	Root	25096.24	40845.25	4.36	0.64
	Cereal	453.49	217.6	0.08	0.00
	Pulses	10845.95	9532.5	1.50	0.15
	Oilseed	576	54	-	-
	Sub-total	38937	52113	6.21	0.79
Irrigated	2022				
	Cereal	4.1	3	0.00001	0
	Pulses	5269.07	3526.5	3.83	0.06
	Oilseed	48	75	0	0
	Sub-total	5321	3604	3.83	0.06
	2021				
	cereal	3993.95	3730	1.48	0.04
	pulses	15	9	0.003	0.00004
	oilseed	814	221	0.1	0.0016
	Sub-total	4918.95	4114	1.58	0.04
Grand (in US\$)		81467	102440	23.83	849.03

Source: CITG Survey, 2022

The information provided by Table 45 is of significant importance as it highlights the devastating impact of the war on the agricultural vegetable production loss in the region. Table 52 indicates the production loss of the household sector, which was measured using vegetable and root production loss in 2021 and 2022. In the same manner, Table 45 provides quantitative data on the harvest loss of vegetables during the season 2021 due to war damage by the perpetrators. The vegetable loss in 2021 is estimated at US\$14.3 million, resulting from a loss of 52,926.7 quintals due to either remaining unharvested, uncultivated, or field destruction. The loss of vegetable farm output is estimated at a monetary value of US\$14.3 million. only for the harvesting season of 2021. Out of which, the highest vegetable damage has come from the field loss of vegetables and roots amounted to US\$7.67 million.

The report displays the quantitative data pertaining to the vegetable harvest loss that occurred during the 2022 season due to the war. The Table reveals that the sector experienced a vegetable harvest loss of 22,542 quintals and a monetary loss value of US\$11.9 million. In addition, the vegetable that remained unplanted alone had a significant harvest loss of 9,998 quintals. Followed by the loss of 8,903 quintals due to unharvested damage. The loss of such a significant number of harvests can have severe economic implications for the farmers and the

region as a whole. This information can be used to inform policy decisions and allocate resources to mitigate the impact of future wars on the agricultural sector.

Table 45. Irrigated Vegetable Loss Value in 2022 (US\$ in Millions)

Reason for Loss	Crop Type	Land (Tsm di) 2021	Harvest Loss (Q) 2021	Loss Value (2021)	Land (Tsm di) 2022	Harvest Loss (Q) 2022	Loss Value (2022)
Unharvested	Vegetable	2,980	39,684.26	5.6	1,136	8,464.91	1.2
	Root	0	0	0	27	244	0.03
	Other	159.2	1,721.85	0	7	194	0.00
	Total	3,139	41,406	5.6	1,170	8,903	1.23
Unplanted	Vegetable	686.2	7,029.5	0.99	1,763.7	9,853.1	1.39
	Root	6	58	0.01	3	4.5	0.0005
	Other	104	184	0	108.6	141	0.00
	Total	796	7,271.7	1.00	1,875	9,998	1.39
Field Loss	Vegetable	799.1	3,267	1.47	1,269.3	3,582.32	9.28
	Root	53	651	6.20	1.5	0	0.00
	Other	14	331	0	7	59	0.00
	Total	866	4,249	7.67	1,278	3,641	9.28
Grand	—	4,801	52,926.7	14.3	4,323	22,542	11.9

Source: CITG Survey, 2022

What remains to be estimated is the loss value of cash crops, including fruits, perennial trees, and fodder trees. Table 46 provides data on the main cash crop losses that were either left cut, unplanted, or destroyed in the field in the 2021/22 year due to the war. Excluding the damage value that the household incurs as an investment cost for replanting and growing, the sector lost an amount of approximately US\$2.64 million, which would have been earned if these crop fields were fully functioning in the harvesting years of 2021 and 2022. The loss of cash crops can have severe economic implications for the farmers and the region as a whole. This report could be used to inform future research to examine the reasons behind the differences in the loss of the different cash crop types across different perpetrator categories. Understanding these differences can help policymakers develop targeted interventions to reduce the impact of future conflicts on the agricultural sector.

Table 46. Expected Loss Value of Cash Crop in 2021/2022 (US\$ in Millions)

Categories _ 2021	Replanted	Yearly Loss (US\$ in Millions)	Total Loss (US\$ in Millions)
Fruit	3.61	1.15	1.98
Perennial	3.354	0.36	0.36
Fodder	2.333	0.01	0.01
Total	3.489	1.52	2.35
Categories_2022			
Fruit	3.681	0.04	0.13
Perennial	3.652	0.11	0.15
Fodder	4	0.01	0.01
Total	3.673	0.16	0.29
Grand (in US\$)		1.68	2.64

Source: CITG Survey, 2022

The final crop loss is a loss due to the harvest loss in its store by the perpetrators. Table 47 gives a total crop loss of 119,947 quintals of loss, resulting in a loss value of US\$20.63 million in the two consecutive harvesting years. As indicated in Table 47, the higher share (93.94%) of the loss was accounted for by the harvest loss in 2021, which is US\$19.47 million, followed by the loss value of US\$0.25 million incurred due to partial or full damage of the cash crop in this sector.

Table 47. Stored Farm Harvest Loss Value in 2021/2022 (US\$ in Millions)

Categories 2021	Loss Quantity	Loss Value (in Millions of US\$)	Share (%)
Cereal	49050	10.58	54.34
Pulses	2100	0.17	0.87
Oilseed	29422	6.78	34.82
Vegetable	4323	0.28	1.44
Fruit	8408	0.72	3.70
Perennial tree	8001	0.19	0.98
other	3664	0.75	3.85
Total	104,645	19.47	100.00
Categories 2022			
Cereal	534	0.02	8.00
Pulses	166	0.02	8.00
Oilseed	765	0.12	48.00
Vegetable	1175	0.04	16.00
Fruit	1840	0.03	12.00
Perennial tree	3000	0.02	8.00
other	67	0.03	12.00
Total	15,302	0.25	100.00
Grand	119,947	20.63	

Source: CITG Survey, 2022

Overall, the total loss value for the agricultural crop production amounts to US\$ 1,096.133 million for the last two consecutive years. However, considering the price increment of 33% from year of 2022 to the year of 2023, the agricultural production crop loss value goes to the total loss value of US\$ 1,457.9 million. This report provides valuable insights into the impact of the war on the agricultural sector in the region. The loss of such a significant number of crops can have severe economic implications for the farmers and the region as a whole. Therefore, this information can be used to inform the World Bank, UNDP, and other recovery and reconstruction stakeholders to allocate resources to mitigate the impact of future conflicts on the agricultural sector.



Source: CITG Documentation Office, 2022⁶

Animal Loss Value

In this section, we present the amount of livestock production loss caused by damage to animals, death and illness of animals, harvest, and input damage for animals. Before we present the amount of loss, it is important to show the reduction of livestock production in the consecutive three years of harvesting seasons. A total of 47,537 households reported a significant livestock production reduction during the war (2021 and 2022) as compared to the pre-war (2020) period (Table 48). It is visible that the harvest of each animal species has shown a remarkable output reduction from the year of 2020 to years of 2021/22.

Table 48. Amount of Livestock Production in 2020, 2021, and 2022

Type of livestock product	Number of Respondents	Harvest in 2020	Harvest in 2021	Harvest in 2022
Cattle meet	10,828.00	29,300,000.00	8,740,350.00	4,021,013.00
Sheep meet	3,128.00	3,910,216.00	1,062,961.00	737,703.50
Goat meet	4,566.00	5,652,256.00	2,076,300.00	1,682,229.00
Camel meet	15.00	4,060.00	4,003.00	4,003.00
Chicken meet	3,509.00	2,728,270.00	1,312,213.00	469,064.50
Fish meet	46.00	18,618.00	13,495.00	2,102.00
Fattened cattle	2,745.00	15,000,000.00	2,781,746.00	1,343,722.00
Fattened sheep	1,753.00	2,236,122.00	1,079,145.00	456,360.00
Fattened goat	1,478.00	2,112,642.00	946,167.50	308,904.00
Fattened camel	21.00	158,018.00	100,010.00	130,009.00
Fattened chicken	860.00	935,275.00	774,577.00	68,348.00
Milk	2,932.00	17,500,000.00	7,095,328.00	3,266,986.00
Butter	2,719.00	1,212,823.00	673,079.60	309,270.50
Cheese	169.00	207,057.00	66,042.00	11,962.00
Other milk by-products	55.00	39,102.00	31,049.00	102,637.00

⁶ The above figure reveals that the perpetrator's destruction of the household crops is a systematic for the entire household's livelihood. The perpetrators intentionally mix the households' crops, noting that the households lose their livelihood means.

Type of livestock product	Number of Respondents	Harvest in 2020	Harvest in 2021	Harvest in 2022
Pack milk	14.00	4,095.00	166.00	227.00
Egg	3,068.00	85,500,000.00	3,297,898.00	261,856.00
Calf crop	1,657.00	384,827.00	205,045.00	136,267.00
Sheep offspring	622.00	119,173.00	85,634.00	43,657.00
Goat offspring	848.00	63,747.00	181,513.00	63,257.00
Donkey new-born	293.00	61,287.00	30,895.00	21,113.00
Camel new-born	10.00	21,206.00	1,099.00	1,099.00
Bee new-born	83.00	31,132.00	24,903.00	6,792.00
Fertile eggs	834.00	2,790,538.00	875,273.00	122,755.00
Chick-day-old	963.00	626,661.00	496,026.00	59,097.00
Fish new-born	1.00	150.00	-	-
White honey	381.00	403,281.50	262,917.00	69,645.00
Mixed honey	82.00	61,185.00	52,776.00	10,534.00
Red honey	265.00	123,871.00	64,361.50	14,342.50
Wax	5.00	80.00	4.00	2.00
Other honey products	39.00	101,163.00	38,457.00	31,165.50
Hide	42.00	15,263.00	8,534.00	786.00
Sheep skin	102.00	23,966.00	6,755.00	2,928.00
Goat skin	106.00	14,901.00	2,988.00	14,042.00
Fish harvest	2.00	358.00	258.00	258.00
Ox service	1,152.00	3,875,812.00	2,251,298.00	1,408,339.00
Ox service of impregnation	45.00	20,606.00	14,774.00	4,522.00
Donkey service	174.00	390,799.00	185,393.00	205,759.00
Horse service	18.00	246,709.00	32,456.00	18,401.00
Mule service	9.00	620,064.00	300,434.00	70,016.00
Other	1,891.00	2,557,424.00	597,829.80	494,148.30
Total	47,537	179,000,000	35,774,153	16,000,000

Source: CITG Survey, 2022

Once we have information on the amount of livestock production reduction, we quickly present the number of losses in terms of numbers and monetary value. Table 49 reveals that the livestock production loss of the household sector was measured using the livestock production loss, livestock service loss, livestock stored fodder loss, and livestock stored product Loss. Specifically, in absolute monetary terms, the livestock production loss in 2021 was estimated to be US\$294 million. Similarly, the livestock production loss in 2022 was estimated at around US\$265 million, amounting to a total livestock production loss of US\$559 million in the harvesting years of 2020/21 and 2021/22.

Table 49. Livestock Production Loss in 2021/2022 (US\$ in Millions)

Type of livestock product	Number of Respondents	Quantity (in 2021)	Loss Value (In 2021, US\$ in Million)	Quantity (in 2022)	Loss Value (in 2022, US\$ in Millions)
Cattle meat	4,324.00	4,173,569.00	66.61	3,738,867.0	53.004
Sheep meat	2,101.00	1,436,298.00	21.55	1,504,135.0	18.551
Goat meat	2,788.00	1,774,724.00	24.03	1,882,663.0	24.382
Camel meat	21.00	28,369.00	0.38	27,657.50	0.320
Chicken meat	1,786.00	878,675.00	8.83	905,308.00	8.163
Fish meat	20.00	11,230.00	0.23	29,023.00	0.117
Fatted cattle	2,386.00	1,835,292.00	37.28	1,866,723.0	32.155
Fattened sheep	2,484.00	1,530,683.00	29.51	1,693,600.0	26.148
Fattened goat	2,235.00	1,189,501.00	23.85	1,344,857.0	23.852

Type of livestock product	Number of Respondents	Quantity (in 2021)	Loss Value (In 2021, US\$ in Million)	Quantity (in 2022)	Loss Value (in 2022, US\$ in Millions)
Fattened camel	111.00	97,112.00	2.30	80,428.00	1.661
Fattened chicken	1,538.00	580,935.00	7.33	525,763.80	4.894
Milk	1,127.00	1,933,581.00	8.30	1,620,215.0	7.085
Butter	765.00	406,920.00	4.22	452,039.90	5.389
Cheese	63.00	38,940.00	0.28	32,081.00	0.341
ajbo	27.00	13,558.00	0.04	8,575.00	0.049
Packed milk	7.00	5,215.00	0.04	5,560.00	0.036
Table eggs	1,027.00	1,148,407.00	2.42	792,463.00	1.979
Calf crop	578.00	298,397.00	4.52	366,714.00	4.558
rema	282.00	70,126.00	1.06	104,015.00	1.701
mahsie	417.00	102,744.00	1.78	196,271.00	3.163
Donkey newborn	449.00	407,405.00	6.24	403,838.00	4.859
Camel newborn	20.00	17,316.00	0.37	15,002.00	1.212
Bee colony	354.00	104,459.00	2.42	247,855.00	3.852
Fertile eggs	397.00	321,807.00	1.30	235,707.00	0.788
Chicken newborn	916.00	342,756.00	3.07	412,119.00	3.392
Fish newborn	5.00	1,218.00	-	-	-
White honey	601.00	266,050.50	3.89	361,021.00	4.629
Mixed honey	115.00	46,692.00	0.63	82,067.00	0.913
Red honey	171.00	115,109.00	1.58	153,151.00	1.359
Wax	10.00	12,230.00	0.16	219.00	0.002
Other honey byproducts	47.00	27,649.00	0.53	26,557.00	0.843
Hide	23.00	14,799.00	0.25	14,437.00	0.230
Sheep skin	103.00	40,964.00	0.20	56,061.00	0.256
Goat skin	73.00	27,461.00	0.11	29,601.00	0.247
Harvested fish	3.00	6,004.00	0.01	4.00	0.000001
Oxen service	303.00	300,321.00	6.10	293,223.00	5.795
Oxen service for breeding	29.00	27,726.00	0.64	18,934.00	0.295
Donkey service	396.00	343,166.00	5.37	365,799.00	4.311
Horse service	44.00	51,904.00	0.95	66,151.00	1.615
Mule service	27.00	54,711.00	0.67	36,217.00	0.825
Other	802.00		14.49		11.837
Total (in US\$)	28,978.00		294.00		265.00

Source: CITG Survey, 2022

Additional Cost

Moreover, the agricultural household incurred unexpected but additional costs of US\$584.046 million for unplanned damage maintenance; purchase expense of water, fodder, firewood, charcoal, improved stove, and solar; purchase expense of farm inputs and equipment; and rental cost due to the destruction. Among the additional costs, the households further lost about US\$3.675 million for medical treatment, food purchase, transportation, and consultation of injured people that the household would save in the absence of the war. Likewise, the sector has a total opportunity cost of US\$219.62 million that would be earned by the region if there were no damage and loss in the household in the harvesting years of 2021 and 2022, and Injured people would earn a total income of US\$6.943 million, and Tigray would invest in the yearly 21 free labor days on natural resource conservation. In addition, the extra cost of the household asset and the housing is estimated at US\$492 million and US\$23.322 million, respectively.

Overall, the total additional cost of the household is estimated at US\$1.331 billion. Furthermore, the households incurred an extra cost of US\$2.1 million for animal tools.

Table 50. Additional Cost Incurred by Households'

Category of Additional Cost	Additional Cots (US\$ in Millions)	Share (%)
Additional cost for household assets	491.2	36.90
Additional cost for housing damage	23.322	1.75
Additional cost for Animal tools	2.1025	0.16
Income loss due to HH Injury	6.943	0.52
Unexpected expense of the HH	584.046	43.88
Medical expenses of the HH	3.675	0.28
Opportunity cost of soil & water conservation	219.62	16.50
Total Cost	1,331.01	100.00

Source: CITG Survey, 2022

Microeconomic Impact of the War

Previous assessment reports have consistently indicated that a variety of impact scenarios typically arise following natural or human-made disasters (ECLAC, 1991, 2010a; Zapata and Madrigal, 2009). It is critically important to differentiate the effects of the disaster by the magnitude of its immediate or long-term consequences across economic, social, spatial, and demographic terms, as the overall impact poses a serious challenge to sustainable development and, specifically, to reducing extreme poverty (UNDP, 2004). Therefore, estimating the microeconomic impacts of damage and losses, such as those caused by war, becomes highly relevant at the household level. To capture these microeconomic effects, information on pre- and post-war daily income, per capita consumption expenditure, uncultivated land, total livestock holdings, damage incidence, internal forced displacement, food insecurity, and housing status was used. Despite the difficulty in fully estimating all microeconomic impacts, the analysis successfully captured medium-term effects on income, subjective poverty, food insecurity, and displacement days.

Households' War Damage Incidence and Displacement

Based on the assessment of damage incidence among household heads, the war in Tigray inflicted severe and widespread impacts on the population. Of the 657,360 households surveyed, an overwhelming 506,797 (77.1%) reported experiencing some form of damage. This figure clearly demonstrates that the conflict was not localized but caused extensive hardship, affecting over three-quarters of all households. Consequently, only a small minority, 150,563 households, or 22.9% were classified as "Safe." The high prevalence of damaged

households underscores the massive and urgent need for large-scale recovery, reconstruction, and humanitarian assistance across the region.

In the same manner, based on Table 51, the war has resulted in 61% forcefully displaced household heads compared to 39% of non-displaced household heads. The length of displacement days ranges from the minimum 36 days in the South Eastern zone to a maximum of 549 days from the Western zone, with an average length of 274 days. In association with this, 20% of HHs were displaced to the respective zones and 19% of HHs chose to move out of their districts, and 13% preferred to migrate to Mekelle, the capital city of the region.

Table 51. Tabulation of Household Heads' Displacement

zone of the household		Displacement		
		Home	displaced	Total
Central	Number	72666	167976	240642
	%	30.20	69.80	100.00
Eastern	Number	61750	109026	170776
	%	36.16	63.84	100.00
Mekelle	Number	59490	21771	81261
	%	73.21	26.79	100.00
North West	Number	22657	65880	88537
	%	25.59	74.41	100.00
South	Number	23032	17197	40229
	%	57.25	42.75	100.00
South Eastern	Number	18307	16681	34988
	%	52.32	47.68	100.00
West	Number	26	901	927
	%	2.80	97.20	100.00
HH Total	Number	257928	399432	657360
	%	39.24	60.76	100.00
Census Total	Number	995143	1446887	2442030
	%	40.75	59.25	100.00

Source: CITG Survey, 2022

War and Poverty of the Household

Since the start of the war, rural households' livelihood and food security have been reported to deteriorate alarmingly. The sources of livelihood, mainly agriculture, were seriously and adversely affected by the war in Tigray, causing serious poverty and food insecurity. The team collected information regarding subjective poverty. Household Heads were requested to state their status of poverty in comparison to their nearby community using five Likert scale poverty status questions ranging from very poor to very rich. The assessment report (Table 52) showed that approximately 21 percent of rural households were poor before the war, and the majority (69 percent) were average rich, with the rest (10 percent) constituting rich households just one year before the war broke out in November 2020.

Table 52. Distribution of Household Heads' Pre-War Subjective Poverty by Zone

zone of the household	Before war Household's economic status					Total
	very poor	Poor	average	rich	very rich	
Central	2.59	17.94	67.19	10.11	2.17	100.00
Eastern	3.21	21.30	68.43	6.35	0.70	100.00
Mekelle	0.95	8.74	81.55	7.97	0.79	100.00
North West	1.31	13.09	71.32	12.45	1.83	100.00
South	5.01	26.70	59.73	7.59	0.97	100.00
South Eastern	3.52	26.75	60.37	8.37	0.98	100.00
West	0.43	3.88	62.24	26.54	6.90	100.00
Total	2.57	18.01	69.02	8.96	1.44	100.00

Source: CITG Survey, 2022

In two years after the war (Table 53), approximately 91 percent of households became poor, while only 9 percent of households remained under the category of rich and above poverty status in 2022. Consistent with this, the team extracted holistic information on households' income obtained from different Economic activities.

Table 53. Distribution of Household Heads' Post-War Subjective Poverty by Zone

zone of the household	After war household's economic status					Total
	very poor	Poor	average	rich	very rich	
Central	42.37	50.16	7.09	0.23	0.15	100.00
Eastern	44.38	47.75	7.54	0.22	0.11	100.00
Mekelle	32.07	59.02	8.57	0.26	0.08	100.00
North West	42.45	49.46	7.66	0.29	0.14	100.00
South	30.10	54.00	15.30	0.52	0.08	100.00
South Eastern	30.53	52.11	16.52	0.73	0.11	100.00
West	60.09	37.86	1.29	0.54	0.22	100.00
Total	40.27	50.86	8.46	0.28	0.12	100.00

Source: CITG Survey, 2022

The assessment team also measured household objective poverty by gender using a poverty line of \$US2.15 as supposed by World Bank (World Bank, 2022). Accordingly, 71.67% was above poverty 28.33% of the population were below poverty before. Using disaggregated data, 66.52% of females and 74.96% of males were above poverty before the war.

Table 54. Before and after War of HH's Objective Poverty Status

Sex	Poverty Status 2020			Poverty Status 2021		
	Rich	Poor	Total	Rich	Poor	Total
female	170397	85756	256153	21388	234765	256153
	66.52%	33.48%	100.00%	8.35%	91.65%	100.00%
male	300755	100452	401207	43099	358108	401207
	74.96%	25.04%	100.00%	10.74%	89.26%	100.00%
Total	471152	186208	657360	64487	592873	657360
	71.67%	28.33%	100.00%	9.81%	90.19%	100.00%

Source: CITG Survey, 2022

However, the war brought a significant effect on poverty of the population, indicating that only 9.81% remained above poverty while 90.19% of the population became poor. Considering

gender disaggregation, only 91.65% of females and 89.26% of male became poor though there is minor difference between the gender's poverty statuses (Table 54)

War and Household Food insecurity

The total income of 657,360 household heads reached US\$ 2.633 billion in 2019. However, war-related damage and losses reduced the income to just US\$ 272.08 million in 2021 and US\$ 29.68 million in 2022. This indicates a major income decline or loss in the region, leading to severe livelihood deterioration.

Overall, a number of studies reveal that violent war, siege and blockade has a strong negative and significant effect on food security. It is often agreed that violent war, siege and blockades threaten food security and household welfare in sub-Saharan Africa. The war in Tigray led to rapid spikes in already high energy, agricultural commodity, and fertilizer prices. Inland and air transport was completely banned, and as a result flow of goods and services coming in and going out was frozen. Prices of goods and services skyrocketed. Due to this, the international index that measures hunger worldwide, the Integrated Food Security Phase Classification (IPC), placed 5.5 million people in Tigray at Phase 4 of the IPC Scale, humanitarian emergency, and 350,000 at Phase 5, which corresponds to famine / humanitarian catastrophe. Between 437 and 914 people died every day from starvation in Tigray during this full siege and war (Awange, 2022). The full blockage hampered economic activities and restricted humanitarian access, resulting in 70% of the population experiencing starvation, high levels of acute food insecurity, and excessive mortality (Plaut, 2021).

The data we used to measure food insecurity at the household level was constructed following the measurement of food access indicators guide by Coates et al. (2007) for the months of May 2019 and May 2022. One of the most relevant questions in the questionnaire asks if the household experienced a food shortage in the month of May 2019 and 2022. Based on the report in Table 64, households experiencing war, siege and blockade appear to do worse during and after the war; the report in table 64 showed that 74 % of the households were food secure, while 4.75% were severely food insecure, with a moderate food insecurity of 14.05% in the baseline period, 2019. However, households experiencing war damage and loss automatically became food insecure in the post-war period, 2021/22.

Table 55. Distribution of HH Food Insecurity in 2012 by Zone

zone of the household	Food Insecurity Status (Number of Respondent and Share(%))				
	Food secure	Mildly food-insecure	Moderately food insecure	Severely food-insecure	Total
Central	171052 71.08%	16581 6.89%	39880 16.57%	13129 5.46%	240642 100.00%
Eastern	123299 72.20%	14085 8.25%	24431 14.31%	8961 5.25%	170776 100.00%
Mekelle	66818 82.23%	5264 6.48%	7241 8.91%	1938 2.38%	81261 100.00%
North West	74034 83.62%	3722 4.20%	7994 9.03%	2787 3.15%	88537 100.00%
South	26614 66.16%	3748 9.32%	7567 18.81%	2300 5.72%	40229 100.00%
South Eastern	25227 72.10%	2607 7.45%	5078 14.51%	2076 5.93%	34988 100.00%
West	746 80.47%	34 3.67%	139 14.99%	8 0.86%	927 100.00%
Total	487790 74.20%	46041 7.00%	92330 14.05%	31199 4.75%	657360 100.00%

Source: CITG Survey, 2022

In contradiction to our baseline report, our report (Table 56) also shows that only 18.73 % of the households that experienced war damage during the war period became food secured. On the other hand, 10.27% of households show a severe food insecurity status, with 39.93% and 31.08% becoming mildly food insecure and moderately food insecure, respectively, in the post-war period. This implies that the war damage has brought a huge impact, reducing the percentage of food secured housed holds from nearly 74% in pre-war to only 18% in post-war.

Table 56. Distribution of HH Food Insecurity in 2014 by Zone

zone of the household		Food Insecurity Status (Number of Respondent and Share(%))				
		Food secure	Mildly food-insecure	Moderately Food Insecure	Severely Food Insecure	Total
Central	Number	47118	107833	64215	21476	240642
	%	19.58	44.81	26.68	8.92	100.00
Eastern	Number	30251	71533	49682	19310	170776
	%	17.71	41.89	29.09	11.31	100.00
Mekelle	Number	12108	22128	38274	8751	81261
	%	14.90	27.23	47.10	10.77	100.00
North West	Number	16329	40208	21186	10814	88537
	%	18.44	45.41	23.93	12.21	100.00
South	Number	8810	11241	17057	3121	40229
	%	21.90	27.94	42.40	7.76	100.00
South Eastern	Number	8349	8935	13742	3962	34988
	%	23.86	25.54	39.28	11.32	100.00
West	Number	155	608	119	45	927
	%	16.72	65.59	12.84	4.85	100.00
Total	Number	123120	262486	204275	67479	657360
	%	18.73	39.93	31.08	10.27	100.00

Source: CITG Survey, 2022

War and livestock holding and uncultivated land

A further assessment of the livestock holding revealed that the war has negatively affected the livestock and livestock production of the rural households surveyed in this assessment region. A total of 362,493.00 households out of the assessed households (i.e., 657,360) reported that they had animal damage as a result of the war (Table 57). The assessed households reported that there was a total of 2,754,118 animals in 2020 (pre-war). However, the number of animals reduced to 1,329,224 in 2021 and 983,109 in 2022 following the war. This shows that the war resulted in a huge reduction of 1,424,894 and 346,115 animals in the years 2021 and 2022, respectively.

Table 57. Number of Animals in 2020, 2021, and 2022 by Zone

Zone	2020 (Prewar)		2021		2022	
	Number of respondents	Animal Number	Frequency of HH	Animal Number	Frequency of HH	Animal Number
Central	182,253.00	1,410,883.00	98,837.00	690,587.00	98,363.00	529,184.00
Eastern	90,339.00	505,420.00	56,839.00	315,182.00	55,317.00	247,207.00
Mekelle	3,215.00	62,017.00	1,523.00	28,181.00	1,371.00	15,713.00
North West	54,339.00	608,746.00	23,462.00	186,998.00	19,296.00	96,684.00
South	14,424.00	79,763.00	8,252.00	59,870.00	8,607.00	49,449.00
S/Eastern	16,587.00	63,870.00	10,405.00	45,751.00	11,596.00	44,228.00
West	1,330.00	23,407.00	184.00	2,655.00	107.00	644.00
Total	362,493.00	2,754,118.00	199,503.00	1,329,224.00	194,658.00	983,109.00

Source: CITG Survey, 2022

The impact of the war had a drastic negative impact on the number of uncultivated lands caused by the injury of the owner, death of the owner, death of oxen, drought power, lack of seed, and inaccessibility of the area occupied by enemy troops. Regarding this, a study by Nyssen et al. (2022) indicated that most farmers in Tigray failed to plant their lands due to war conditions. 21% of the land is left fallow. Our report revealed that 214,340.48ha (23%) was found to be uncultivated in the 2020/21 harvest season and 293,029.74ha (30.7%) in the harvesting season of 2021/22. In line with this, UNOCHA stated that 25% to 50% the crop production was available in the 2021 harvesting year as the agricultural planting season was missed in many parts of Tigray due to the presence of Eritrean troops.

Moreover, the other impact of the war is that, apart from the direct damage to animals caused by the perpetrators, 28,827 households reported that a total of 177,633 and 173,141 animals became sick and died of different diseases (Table 57).

Unemployment and Inflation Impacts of the War

In Tigray, labor statistics from November 2020 indicate that before the onset of war, siege and blockade, the employment rate stood at 35%. This figure translates to 80,715 individuals engaged in various economic activities out of a total of 232,100 unemployed persons. However, following the war, siege and blockade in Tigray, the number of unemployed individuals surged to 500,340 in 2021 and further escalated to 600,830 in 2022. Consequently, based on the pre-war employment rate, the unemployment rate within the household sector post-war, siege and blockade has risen to 74.1%. This significant unemployment rate underscores the severe economic downturn affecting the region. Ultimately, the household sector's unemployment rate in Tigray has experienced an alarming increase of 111.71% as a result of the crisis.

The war's influence on food prices (inflation): The inflation report sheds light on the inflationary trends affecting food prices, particularly concerning cereal crops, pulses, and vegetables. As illustrated in the accompanying table, the most significant inflation rates were observed in vegetables (310%), pulses (137%), and cereals (92.5%), respectively (Table 58). The inflation rate for cereals and pulses was calculated based on the average price per quintal, while the rate for vegetables was derived from the average price per kilogram. The ongoing war, siege and blockade and siege in the Tigray region have resulted in a sharp increase in the inflation rates of essential food crops, consequently exacerbating food insecurity in that area.

Table 58. The Impact of War on Inflation Rate

Crop types		Number of households	Average price in 2012 (2020)	Average price in 2013 (2021) and 2014 (2022)	Food inflation (%)
Cereals	Sorghum	9694	3320.175	6119.315	84.31
	Teff	3334	4722.615	8759.328	85.50
	Wheat	2486	2167.94	6034.996	178.4
	Total	15514	3320.18	6119.31	92.5
Pulses	Bean	567	4762.61	11910	151
	Pea	184	4939.87	10480.87	114
	Lentil	183	5279.66	10737.29	107
	Total	869	4870.70.27	11449.3	137
Vegetables	Onion	1883	30.47	78.97	162
	Tomato	1138	7.73	45.36	582
	Potato	360	15.42	50.89	239
Total		36212	46.14	164.47	310

Source: CITG Computation, 2022

Furthermore, the line chart presented below illustrates the average prices of essential food items, including cereals, pulses, and vegetables, both prior to and following the war (Figure 4).

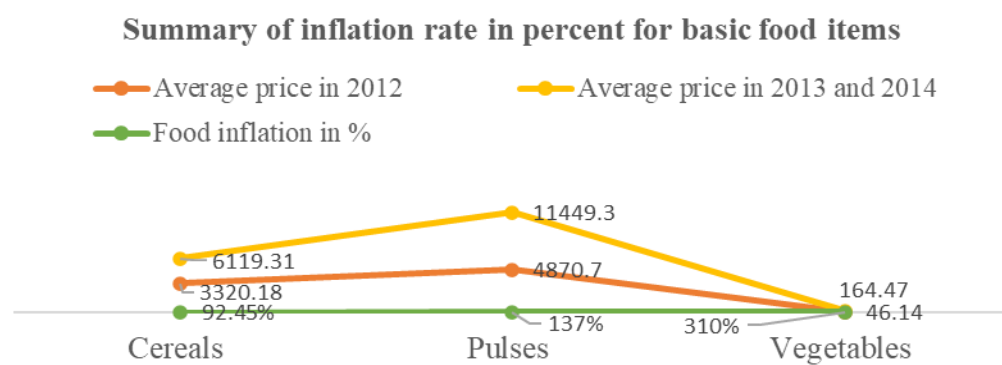


Figure 4: Summary of the inflation rate in percentage for basic food items.
Source: CITG Computation, 2022 and 2023.

2.1.3 Conclusion and Recommendation

Conclusion

The assessment conclusively demonstrates that the war and subsequent blockade inflicted a catastrophic and systemic destruction upon the household sector in the Tigray region. The total estimated damage and loss value for the sector reached a staggering \$4.67 billion over two years (or \$5.22 billion over three years). The key findings of the damage and loss assessment survey revealed that:

- **Pervasive Destruction:** A vast majority of assets were targeted, with 80% of non-housing household assets being completely damaged and 91% of crop farm equipment burned and looted. This massive intentional civilian material damage was primarily attributed to the Ethiopian National Defense Force (ENDF), Eritrean Defense Force (EDF), and Amhara forces.
- **Domination of Loss over Damage:** The loss value (\$2.98 billion in two years) was significantly higher than the damage value, implying that the prolonged blockade and operational constraints (lack of inputs, finance, communication, etc.) were even more devastating to livelihoods than the direct physical destruction of the war itself.
- **Complete Livelihood Collapse:** The war led to a near-total collapse of household income, which plummeted from \$2.63 billion (pre-war 2019) to only \$29.68 million in 2022. This translated directly into a humanitarian crisis, with 91.13% and 81.28% of household heads becoming poor and food insecure in 2021 and 2022, respectively.
- **Agricultural Ruin:** The primary source of livelihood was utterly dismantled, evidenced by the loss of 82% of rural farm animals (killed, slaughtered, or looted) and crop production losses totalling \$1.46 billion over three harvesting years.

Overall, the household sector is fully and severely destroyed, and it cannot return to normal economic activity without substantial external intervention for rehabilitation, reconstruction, and recovery with the principles of build back better.

Recommendation

To address the unprecedented scale of damage and loss and reactivate the household sector economy, the following targeted interventions are imperative:

Immediate Material and Financial Relief:

- **Provide Subsidies and Grants:** Immediate and large-scale grants for food security and non-food items, particularly for the 91% of poor and food-insecure households.
- **Agricultural Starter Packs:** Distribute free and subsidized quality seeds, drought power (oxen/tractors), and farm inputs (fertilizer, fuel) to immediately restore basic agricultural capacity for the upcoming planting season.

Livelihood and Asset Restoration:

- **Asset Replacement Program:** Implement a comprehensive program for the replacement of high-value, fully damaged assets, including farm tools, livestock (animals), and partial reconstruction of housing, given the replacement cost of \$1.7 billion. This requires significant governmental and international donor funding.
- **Financial and Credit Support:** Establish a mechanism for soft loans with flexible repayment schedules and reschedule/forgive existing loans to allow households to regain financial stability without the burden of pre-war debt.

Address Blockade and Infrastructure Deficiencies:

- **Restore Essential Services:** Prioritize the full, unhindered restoration of internet, banking, transport, and communication networks across the region to facilitate economic transactions and reduce additional operational losses.
- **Invest in Drought Power:** Given the extensive loss of livestock and its critical role in farming, a massive investment in restoring livestock or providing accessible tractor/mechanization services is necessary to prevent continued production loss.

Targeted Perpetrator-Based Recovery:

Zonal-Specific Support: Design restoration projects based on the damage distribution, prioritizing Eastern, North Western, and Central Zones for asset and housing repair, focusing on damage caused by the EDF, and South/South East Zones for the damage caused by the ENDF and Amhara forces.

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Agriculture Sector



2.2 Damage and Loss to Agriculture

2.2.1 Pre-war Context

Baseline Agricultural Path and Socio-Economic Role

Prior to the outbreak of war in November 2020, the Tigray Region was experiencing a period of significant economic growth, mirroring the national trend in Ethiopia (World Bank, 2020). Agriculture served as the mainstay of the regional economy, providing employment and income for over 80% of the population, which included approximately 1.4 million agricultural households. The sector was essential, as other regional sectors, including industry and services, were largely dependent on agricultural output. The regional farming system was diverse, encompassing rain-fed staple cereals (such as teff, wheat, barley, and sorghum), horticulture, and extensive livestock production.

The region successfully implemented a ‘Natural Resource Conservation-Based Agricultural Development’ approach, yielding significant results, particularly in environmental rehabilitation. From 1991 to 2020, a sustained focus on sustainable land management (SLM) led to the restoration of degraded landscapes, enhancing agricultural productivity (Araya et al., 2024). Specifically, 30.4% (1,658,242 hectares) of the total land area was successfully restored using physical and biological soil and water conservation (SWC) measures across various watersheds (TBoPF, 2020). These efforts mitigated the challenges of the semi-arid environment (Nyssen et al., 2019) and led to the region receiving the prestigious 2017 UN-backed World Policy Award for its achievements in restoration⁷. These efforts, coupled with government-led extension and improved seed access, underpinned rural food security and provided raw materials for the burgeoning agro-processing industry, cementing agriculture as the primary engine for poverty reduction (FAO, 2020).

Public Agricultural Sector and Institutional Framework

The Public Agricultural Sector in Tigray was designed as a comprehensive, multi-tiered support structure focusing on the entire value chain, from research to market access. This framework was built upon pro-poor and agriculture-sensitive policies implemented since 1991, supported by a robust deployment of agricultural cadres and Development Agents (DAs) across regional, zonal, Wereda, and Tabia levels.

⁷ <https://www.worldfuturecouncil.org/fpa-2017-ceremony-press-release/>

Key public institutions forming this coordinated ecosystem included

Tigray Agricultural Research Institute (TARI): TARI functioned as the central hub for agricultural science, dedicated to developing climate-resilient crop varieties, improved farming techniques, and locally appropriate livestock breeds tailored to the regional ecology. TARI's outputs were critical to the adoption of modern agricultural practices (TARI Annual Report, 2018). The TARI structure included six main research centers.

Regional Bureau of Agriculture (BoA) and Extension Services: The BoA oversaw a decentralized network of staff, including 14,735 Agricultural development agents, experts, leaders, and para-professions (10,577 permanent, 961 contracts, and 3,196 temporaries), as detailed in Figure 1. These personnel, deployed to provide technical support directly to farming communities, were responsible for disseminating knowledge, offering technical training, and managing the supply of subsidized inputs (improved seeds, fertilizers). This system was highly organized, utilizing Farmer Training Centers (FTCs) for hands-on demonstration and learning (MoA, 2018).

Tigray Cooperative and Market Promotion Agency (TCMPA): TCMPA was instrumental in organizing farmers into primary cooperatives and unions, facilitating collective bargaining for input purchases and bulk marketing of agricultural outputs, which served to empower smallholders and reduce market fragmentation.

Tigray Agricultural Transformation Center (TATC): TATC focused on systemic improvements, addressing value chain bottlenecks, and scaling up successful agricultural pilot programs, bridging the gap between policy, research, and practical implementation.

Irrigation and Water Systems: Public investment centred on developing medium and small-scale irrigation schemes, micro-dams, and water harvesting structures. This effort significantly increased the area under double cropping and high-value horticulture, thereby reducing the region's dependency on erratic rainfall (UNICEF, 2020).

Private Agricultural Sector and Commercialization

The pre-war private agricultural sector was dynamic and expanding, having grown significantly over the previous two decades (TBoPF, 2020). The sector was crucial for generating employment, increasing value addition, and driving exports (CIPE, 2021).

The private agricultural landscape was highly segmented: micro- and Small-Scale enterprises were typically family-run, focused on local supply and processing, such as retailing basic inputs (tools, local seeds), small-scale poultry, dairy processing, and food milling. Medium-Scale firms, often structured as limited companies employing 6–50 people, engaged in commercial operations like vegetable farming on leased land, medium-scale dairy and feed production, contract farming, and local logistics. The large-scale category involved significant capital investment and high technology use, specializing in large-scale irrigation farms for high-value export crops (e.g., sesame and flowers), mechanized field farming, agro-processing (edible oils and flour mills), and specialized livestock farms.

Crucially, the formal financial institutions (banks and microfinance entities) played an essential role, providing critical support through credit for capital expenditure, seasonal loans for input purchases, and insurance products to manage risk (World Bank, 2020). This combination of public support and private investment was key to the region's successful agricultural trajectory, enabling the private sector to formalize trade channels and link local production to national and international markets, particularly for export commodities like sesame and pulses (Tekulu, 2024).

Development and Production Baseline

Animal Resources Development and Production

Tigray was recognized as the fourth wealthiest region in Ethiopia in terms of animal population, totalling approximately 17 million animal populations (equivalent to 5.2 million TLU) in 2019/20 (CSA, 2019/20). This population included 4.9 million cattle, 2.1 million sheep, and 4.8 million goats, alongside significant poultry and bee colonies. The region was renowned for excellent indigenous genetic potential, including the Begait cattle, sheep, and goat breeds, Raya cattle breeds, and Abergelle and Erob goat breeds.

Animal resources contributed significantly to the economy, accounting for an estimated 34–48% of the agricultural GDP and 16–20% of the national GDP. They provided draft power, organic fertilizers, animal-source foods, and were a source of financial savings for over 83% of farmers (Araya et al., 2023). Public investment expanded animal health and Artificial Insemination (AI) services, resulting in the construction of about 201 public and 20 private veterinary clinics and 108 AI centers. As illustrated in Figure 2, this infrastructure led to significantly increased access and coverage of veterinary services. By 2018, Tigray produced 222.4 million liters of milk and 22 million eggs (CSA, 2018/19), with fish production reaching

25,000 quintals in 2020 (BoARD, 2021). Efforts in sustainable land management also contributed to an increase in honeybee colonies, which grew from 173,948 in 2004 to 332,391 in 2020, with annual honey production rising from 1,377 tons to 4,739 tons (CSA, 2021).

Crop Development and Production

Tigray utilized approximately 945,349.76 to 1 million hectares of cultivable cropland, representing about 25% of the total landmass. Staple crops like teff, barley, wheat, maize, sorghum, and finger millet have been cultivated since the Axumite era. Through sustained development efforts, grain crop yield increased up to 300% in some areas (Gebregziabher et al., 2016), with high productivity continuing for about 10 consecutive years. For the 2019/20 agricultural season alone, Tigray produced a total of over 20.2 million quintals of grain crops, 702,158.5 quintals of pulses, and 961,213.8 quintals of oilseed (ECSA, 2019/20).

Irrigation development was transformative, with capacity growing to cover approximately 60,000 hectares of irrigated land. Over 35,000 irrigation schemes and about 100 water reservoirs (small to large dams) were constructed between 1991 and 2020, enabling 50,000–64,000 ha of land to shift into irrigated farming, providing 2 to 3 reliable crop harvests per annum. The results of these developments significantly contributed to economic growth, reducing the regional poverty rate from 61% in 1991 to 29% in 2018 and increasing life expectancy from 43 years in 1991 to 66 years in 2020. As a defining measure of the region's agricultural success and the culmination of decades of public and private investment, the trajectory of sustained crop production culminated in a high point in 2018, registering an impressive annual yield of approximately **21 million quintals** (BoANR, 2024).

Agricultural Infrastructures and Facilities

Decades of public and private investment led to the successful expansion of a wide range of agricultural infrastructures and facilities. As summarized in Table 2, this includes 4,524 buildings and agricultural offices, 223 veterinary clinics, 108 Artificial Insemination (AI) Centers, and 44,941 Farmer Training Centers (FTCs). Furthermore, the region possessed specialized facilities crucial for modernization, such as four laboratories (veterinary, plant, and soil), three seed enterprises, a unique Tissue Culture facility with a 40 million capacity, an export abattoir, and six TARI research centers (TIC, 2024). This extensive network of physical and institutional assets underpinned the region's agricultural success.

The twenty-nine years between 1991 and 2020 marked a profoundly successful agricultural trajectory for Tigray, characterized by the establishment of robust public institutions, the emergence of a dynamic private sector, and decades of meticulous environmental restoration that led to impressive gains in crop and animal productivity. This period built a foundational resilience for the region. However, this hard-won stability was violently interrupted and drastically dismantled by the outbreak of the war in November 2020, compounded by an unrelenting siege and blockade. The conflict led to the catastrophic collapse of agricultural systems painstakingly constructed over three decades, resulting in the wholesale loss of critical resource bases and the failure of essential support structures.

2.2.2 Results

Respondent Profile

As stated in Table 59, a total of 4,071 entities (84 public agricultural units, 18 cooperatives, and 3,967 private firms) were assessed. Of which, almost the majority of the public units were assessed. However, only 40.63% of the private units were assessed. This shows that many private units were underassessed.

Table 59. Number of assessed entities

Categories		No. Existed	No. Assessed	Share (%)
BoANR		1	1	100.00
Zonal Agriculture Offices		7	6	85.71
Woreda Agriculture Offices		84	70	89.29
TARI centers		5	5	100.00
TCMPA		1	1	100.00
TCMPA commission		1	1	100.00
Agricultural cooperatives		4332	18	0.42
Total public		4431	102	2.51
Private agricultural firms	Micro	9,421	3,610	42.22
	Small		134	
	Medium		37	
	Large	107	25	23.36
	Unidentified		163	
Total Private Firms		9,528	3,969	97.49
Total		13,959	4,071	29.16

Source: CITG Survey, 2022 and 2023

Considering the private agricultural firms (commercial farms), an analysis of the business forms that reported agricultural damage and loss reveals a critical fact about the sector: Sole proprietorships overwhelmingly dominate the agricultural landscape, accounting for a massive 94% of all reported cases (Figure 5, left panel). This figure signifies that the farming economy is highly fragmented, consisting predominantly of family-run enterprises and small-scale operations. In contrast, formal corporate structures play a negligible role in the damage reporting, with partnerships at 4%, and both cooperatives and public limited companies (PLCs) registering a mere 1% each.

As stated in Figure 5 (right panel), the size distribution of businesses reporting damage and loss is overwhelmingly skewed towards micro enterprises, which represent **91%** of all assessed cases. This concentration signifies that the impact of the war, as captured by the Damage and Loss Assessment (DALA) reporting, was borne predominantly by the smallest, most localized business entities. The remaining categories small (3%), medium (5%), and large (1%) together account for less than one-tenth of the total reported damages.

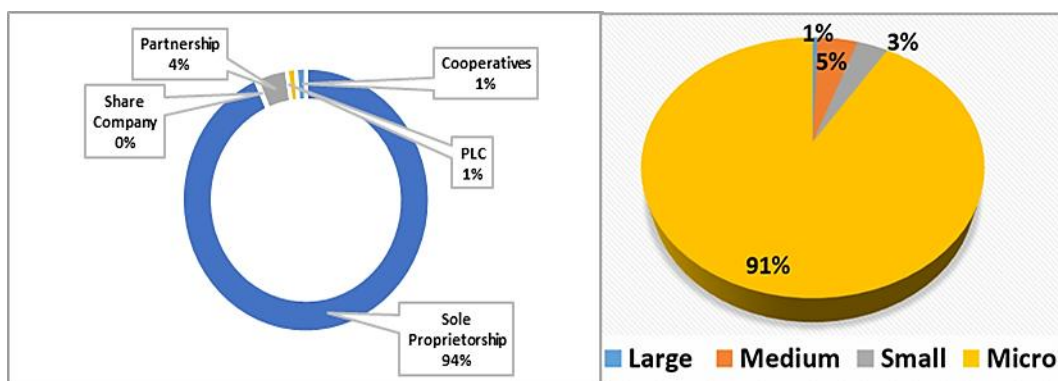


Figure 5: Distribution of Firms by Form of Business (Left panel), Firm Size (Right panel), Size of Business
Source: CITG Survey, 2022 and 2023.

Damage to Agricultural Assets by item

This report documents physical loss, destruction, looting, or functional impairment of crops, livestock, farming equipment, agricultural inputs (seeds/fertilizers), irrigation systems, storage facilities, or land productivity sustained by a household or community during or as a direct result of armed conflict, verified through household surveys, key informant reports, or field observation.

Table 60 revealed that the total financial damage to the agricultural sector in Tigray due to the war amounted to an estimated US\$5448.33million. The overwhelming majority of this devastation, US\$5227.92 million (95.96%), was sustained by the Private sector, while the public sector recorded a comparatively minor US\$220.41 million economic damage.

Table 60. Quantity and value of Damage by Item (values in Million US \$)

Item Categories	Quality damaged ⁸		Value of damage		Total		
	Public	Private	Public	Private	Qty Damaged	Value of damage	Share(%)
Agricultural inputs and feed	32025	494417	1.34	48.78	526442	50.12	0.92
Animal	11436	655570	2.38	46.67	667006	49.04	0.90
Animal product	19840	1805661	1.61	210.30	1825501	211.90	3.89
Artificial insemination asset and infrastructure	69091	-	0.79	0.00	69091	0.79	0.01
Building and Parts	3732	55992	29.84	73.47	59724	103.31	1.90
Cereals	8577	502656	1.03	51.40	511232	52.43	0.96
Consumables	99730	1356757	1.63	230.00	1456487	231.63	4.25
Documents, Books and Archive	41411	-	0.71	0.00	41411	0.71	0.01
Durable property	8041	1171456	0.21	2412.90	1179497	2413.11	44.29
Electrical assets and infrastructure	20421	564685	2.29	1338.32	585106	1340.61	24.61
Fruits	130	1405682	0.00	200.97	1405812	200.97	3.69
FTC asset and infrastructure	46590	-	4.84	0.00	46590	4.84	0.09
Hazardous Materials and Wastes	109	63	0.00	0.00	172	0.00	0.00
ICT assets and infrastructures	6399	103544	2.18	422.29	109943	424.47	7.79
Lab assets and infrastructure	382	-	5.53	0.00	382	5.53	0.10
Office equipment and materials	74631	72803	150.13	67.23	147434	217.37	3.99
Property on transit	-	24393	0.00	0.53	24393	0.53	0.01
Pulse and Oilseed	520	166131	0.03	23.31	166651	23.34	0.43
Vegetables	115223	789047	0.76	85.47	904270	86.23	1.58
Vehicle and spare parts	9179	7602	12.22	16.28	16781	28.50	0.52
Vet drugs and supplies	5084752	-	2.90	0.00	5084752	2.90	0.05
Grand Total			220.41	5227.92		5448.33	100.00

Source: CITG Survey, 2022 and 2023

⁸ We are unable to provide a Grand Total for the Damaged Quantities because the listed item categories were measured using different units

Private Sector Damage Analysis: The private sector's economic damage was concentrated in high-value, fixed assets rather than perishable crops or livestock. The single largest category of damage was Durable Property at US\$2412.90 million, representing 46.15% of the total private loss, which includes farm machinery and long-term equipment. The second most impacted category was Electrical Assets and Infrastructure at US\$1338.32 million, indicating severe disruption to essential utility networks. High-value communications assets, categorized as ICT Assets and Infrastructure, also saw significant destruction valued at US\$422.29 million. Direct agricultural production losses were notable but smaller in proportion, with Consumables at \$230.00 million, Animal Products at US\$210.30 million, and Fruits at US\$200.97 million.

Public Sector Damage Analysis: Public sector losses, totaling US\$220.41 million, centered primarily on institutional and administrative capacity. The largest loss was recorded under Office Equipment and Materials at US\$150.13 million (68.13% of the public total), suggesting extensive damage to government agricultural service and administrative centers. Damage to Building and Parts followed at US\$29.84 million, impacting official facilities. Losses to Vehicle and Spare Parts at US\$12.22 million and Lab Assets and Infrastructure at US\$5.53 million severely compromised government mobility and research capabilities. While Vet Drugs and Supplies reported a high quantity of damage, their financial value was relatively low at US\$2.90 million, reflecting a severe blow to public animal health services.

Damage to Buildings and Building Components

As indicated in Table 61, the total damage to buildings and building accessories within the agricultural sector of Tigray due to the war is estimated at US\$103.31 million. Animal Sheds and Offices suffered the greatest financial losses. Animal Sheds incurred the highest monetary damage, reaching US\$24.76 million (23.97% of the total), with 8,837 units damaged. Following closely, Offices sustained damage totalling US\$18.61 million (18.02% share), affecting 1,720 units. Collectively, these two categories account for nearly 42% of the total damage value. Significant losses were also recorded for the Store or warehouse (US\$11.15 million, 10.79% share), Workers' residency and kitchen (US\$10.27 million, 9.95% share), and Residence (US\$8.99 million, 8.70% share).

The sheer volume of destruction is highlighted by the "Others" category, which, while accounting for US\$15.97 million (15.46% share), recorded the highest number of damaged items at 32,950. In total, just seven categories Animal Shed, Office, Others, Store or warehouse, Workers' residency and kitchen, Residence, and Training facility account for over 85% of the

total estimated damage value. This destruction critically compromises the sector's operational capacity across production, storage, and management services, leading to severe disruptions in livestock supply and essential resource availability. Furthermore, the extensive loss of worker housing and support facilities directly stalls economic recovery, exacerbates humanitarian dependency, and increases investment risk. These profound functional and socio-economic challenges underscore the urgent need for comprehensive intervention focused on rapidly rebuilding this essential infrastructure to stabilize food production and restore livelihoods in the region.

Table 61. Damage by Building and Building Accessories (US\$ in Millions)

Type of damaged building and its parts	Quantity	Damage value (Million in US\$)	Share (%)
Animal Shed	8837	24.76	23.97
Beekeeping centre	255	0.84	0.82
commercial facility	95	0.23	0.22
Computer centre	3	0.05	0.05
farm facility	25	0.15	0.14
Fence work	107	0.01	0.01
Fish multiplication centre	13	0.05	0.04
Garage	1	0.01	0.01
Gate and fence	3644	0.22	0.21
Honey marketing facility	40	0.76	0.74
Laboratory	59	0.45	0.44
Library	4	0.04	0.04
Milling facility	1	0.00	0.00
Office	1720	18.61	18.02
Others	32950	15.97	15.46
Plant clinic	41	0.29	0.28
Powerhouse and electric distribution	6	0.02	0.02
Residence	4223	8.99	8.70
Restraint and cafeteria	2	0.04	0.04
Security house	103	0.19	0.19
Small houses	6	0.00	0.00
Store or warehouse	1973	11.15	10.79
Training facility	296	7.29	7.05
vet clinics, crash and equipment	352	1.98	1.92
Water reservoir/tanker	174	0.78	0.76
Workers' residency and kitchen	4782	10.28	9.95
Workshop	12	0.15	0.14
Total		103.31	100.00

Source: CITG Survey ,2022 and 2023

Damage Type

An analysis of the types of damage sustained reveals that physical destruction and theft account for the overwhelming majority of the financial losses. Broken damage is the single largest contributor by value, estimated at US\$ 53.16 million, representing 51.46% of the total damage, affecting 30,404 damaged items. This indicates widespread structural failure and direct destruction of building components. Following closely, damage categorized as Looted accounts for the second-largest share, valued at US\$ 37.72 million (36.51%), with 18,856 units

affected. Combined, Broken and Looted damage represent nearly 90% of the financial burden. Damage from Burned structures, while significant in quantity (7,756 units), accounts for a lower relative value of US\$ 10.32 million (9.99%), suggesting that fire was a less financially dominant form of destruction compared to outright breakage and theft.

Table 62. Damage to Building and Building parts by Damage type (US\$)

Damage type	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Broken	30404	53.16	51.46
Burned	7756	10.32	9.99
Combined & Others	2708	2.11	2.05
Looted	18856	37.72	36.51
Total		103.31	100.00

Source: CITG Survey ,2022 and 2023

In summary, the high proportion of financial loss stemming from Broken and Looted categories suggests that reconstruction and recovery efforts must prioritize securing sites against theft and addressing widespread structural failure over fire damage remediation.

Damage Severity Level

The financial loss due to infrastructure damage is overwhelmingly concentrated in the most severe categories (Table 63), highlighting the devastating scale of destruction. Of the total US\$ 103.31 million in damages, complete damage accounts for the single largest financial share, reaching US\$ 61.99 million, which represents 60 % of the total cost and includes 21,639 fully destroyed units. When combined with Severe Damage (US\$ 17.87 million, 17.30% share), the most extreme categories represent approximately 77. 3% of the entire financial burden on the agricultural sector. Damage classified as Moderate contributed US\$ 16.18 million (15.67%). Conversely, Minor Damage, while having the lowest financial share at US\$ 7.26 million (7.03%), affected the highest number of physical units, totaling 27,563 damaged items. This distribution indicates that recovery efforts must allocate the vast majority of resources toward complete reconstruction, rather than mere repair.

Table 63. Damage to Building and Building Parts by Damage Severity Level (US\$ in Millions)

Damage Severity Level	Damaged Quantity	Damage Value (US\$ in Millions)	Share(%)
Complete Damage	21639	61.99	60.00
Minor Damage	27563	7.26	7.03
Moderate Damage	3301	16.18	15.67
Severe Damage	7221	17.87	17.30
Total	59724	103.31	100.00

Source: CITG Survey ,2022 and 2023

Means of Damage Execution

As depicted in Table 64 The analysis of how the US\$ 103.31 million in damage was inflicted reveals that non-kinetic destruction and theft account for the majority of the losses. Damage resulting from Burning and Looting represents the largest financial share at US\$ 35.04 million (33.92%) and affected the highest number of units (39,421). When combined with standalone Looting (US\$ 30.32 million, 29.35%), these non-kinetic means are responsible for approximately 63.27% of the total financial loss. In contrast, direct military action, primarily Shelling, caused the second-highest financial damage, totalling US\$ 32.95 million (31.89%). Damage from Airstrikes was comparatively minimal, contributing the lowest specified share at 4.51% (US\$ 4.66 million). This distribution indicates that while shelling caused significant financial destruction, the overall cost to agricultural infrastructure was predominantly driven by widespread theft and arson.

Table 64. Damage of Building and Building parts by Means of Damage (US\$ in millions)

Means of Damage	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Airstrike	384	4.66	4.51
Burning and Looting	39421	35.04	33.92
Looting	13357	30.32	29.35
Others	45	0.34	0.33
Shelling	6517	32.95	31.89
Total		103.31	100.00

Source: CITG Survey, 2022 and 2023

This distribution indicates that recovery efforts must be twofold, requiring not only extensive reconstruction to address military destruction but also urgent security measures to prevent theft and arson, which have proven to be the largest contributors to the financial burden.

Damage by Perpetrators

According to Table 65 The structural damage to the sector's buildings and building parts resulted in a total estimated replacement cost of US\$103.31 million, confirming a massive financial burden on physical infrastructure. The majority of this loss is attributed to Combined forces (30.03%, or US\$31.03 million) and the Eritrean Defense Forces (EDF), which inflicted the second-highest damage value at US\$29.71 million (28.75%). This concentration highlights the large-scale nature of the destruction, heavily dominated by either multi-actor operations or external involvement. Further demonstrating this coordination, joint operations between the Ethiopian National Defense Forces (ENDF) and the EDF accounted for a substantial US\$21.60 million (20.91%) of the total cost. The remaining damage was split among the ENDF

(US\$10.64 million) and the Amhara Forces (AMF) (US\$5.01 million). Although the EDF ranked second in financial cost, the quantity of damage attributed to them was the largest (10,700 units), indicating a focus on the widespread destruction of numerous, smaller structures. The data clearly confirms that the entire structural damage was a direct result of large-scale military action, predominantly from the EDF and coordinated coalition efforts.

Table 65. Damage to Building and Building parts by Perpetrators share (US\$ in Millions)

Perpetrators	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
AMF	660	5.40	5.23
Combined	34856	31.03	30.03
EDF	10700	29.71	28.75
ENDF	5327	10.64	10.30
ENDF_EDF	7884	21.60	20.91
IRF	297	4.93	4.77
Total	59724	103.31	100.00

Source: CITG Survey ,2022 and 2023

Damage to Vehicles in Agriculture

The total estimated damage to vehicles and spare parts in the agricultural sector of Tigray amounts to US\$ 28.50 million across 16,781 units (Table 66). The financial losses are heavily concentrated in specialized agricultural machinery and transport vehicles. Tractors incurred the most significant financial damage, totalling US\$9.01 million, which accounts for 31.63% of the total vehicular loss. This is followed by Pickup trucks, which contributed US\$5.97 million (20.94%), and Minibuses, which added US\$3.53 million (12.40%) to the damage total. Collectively, these three vehicle types account for approximately 65% of the overall damage value. While specialized machinery represents the highest value loss, the sheer quantity of damaged items is dominated by Minibuses, with 6,584 units, and Spare parts and tyres, which recorded the highest quantity of damaged units at 8,079. This distribution indicates both the crippling loss of essential farming equipment and the widespread destruction or theft of transport capacity and basic maintenance components.

Table 66. Damage by Vehicle Type (US\$ in Millions)

Type of damaged Vehicles and spare parts	Quantity	Damage value (Million in US\$)	Share (%)
Bicycle	47	0.01	0.03
Big Bus	35	1.36	4.78
Boxer	1	0.00	0.01
Bulldozer	1	0.04	0.13
Cart	5	0.00	0.01
Carthorse	39	0.68	2.40
Excavator	1	0.03	0.10
Forklifts	2	0.04	0.15
Generator	15	0.05	0.19
Minibus	6584	3.53	12.40

Type of damaged Vehicles and spare parts	Quantity	Damage value (Million in US\$)	Share (%)
Motorbike	891	1.72	6.01
Others	561	2.45	8.60
Pickup	71	5.97	20.94
Spareparts and tyre	8079	2.26	7.91
Suzuki/Nisan	42	0.42	1.49
Tractors	357	9.01	31.63
Tri-wheelers	26	0.18	0.63
Truck	24	0.74	2.60
Grand Total	16781	28.50	100.00

Source: CITG Survey ,2022 and 2023

Damage Type

As indicated in Table 67 the total value of US\$ 28.50 million in damage sustained by vehicles and spare parts reveals a strategic duality between the magnitude of financial damage and the prevalence of physical loss. The majority of the financial burden, 55.22% (US\$ 15.74 million), is attributed to the Combined damage category, which represents assets subjected to multiple destructive actions (e.g., bombing, damage, and looting). This indicates that the assets targeted for the greatest severity of impact are responsible for over half of the quantified cost. Conversely, Looting represents the overwhelming mechanism of physical loss, accounting for 15,413 items, or 91.85% of the total damaged quantity. While looting constitutes 43.89% (US\$ 12.51 million) of the monetary damage, its dominance in unit quantity confirms that outright theft and unauthorized extraction were the most widespread mechanisms of asset removal across the sector. Damage caused by Burning was monetarily and numerically negligible (0.88%). Thus, the data illustrates a campaign that balanced the maximization of financial destruction by using combined methods

Table 67. Damage to Vehicles and vehicle spears by Damage Type (US\$ in Million)

Damage Type	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Burned	21	0.25	0.88
Combined	1347	15.74	55.22
Looted	15413	12.51	43.89
Total	16781	28.50	100.00

Source: CITG Survey,2022 and 2023

Damage Severity Level

The severity level analysis demonstrates that damage to agricultural vehicles is overwhelmingly characterized by total loss. Full Damage accounts for an extraordinary US\$ 26.27 million, representing 92.02 percent of the total US\$ 28.50 million financial damage, and involved 16,534 units. Minor, moderate, and severe damage combined make up the remaining 7.98 percent of the financial losses. This extreme concentration of value in the full damage

category suggests that vehicles and spare parts were typically either completely destroyed or rendered unusable and irrecoverable, meaning restoration efforts will require outright replacement rather than repair.

Table 68. Damage to Vehicles and vehicle spears by Damage Severity Level (US\$ in Million)

Damage Severity Level	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Complete Damage	16534	26.27	92.02
Minor Damage	89	0.93	3.25
Moderate Damage	58	0.96	3.37
Severe Damage	100	0.39	1.36
Total	16781	28.50	100.00

Means Damage

As stated above in Table 69 the means of damage inflicted on agricultural vehicles and spare parts clearly show that the primary destructive act was looting, which represents US\$ 15.56 million, or 54.61 percent of the total damage value, and affected 15,463 units. Direct military engagement through shelling accounts for the second-largest portion of financial damage, contributing US\$ 10.42 million, or 36.57 percent of the loss, across 983 units. Damage caused by combined burning and looting, airstrikes, and other means were all minor contributors, collectively amounting to less than 9 percent of the total cost. This distribution indicates that recovery efforts must primarily address the massive financial loss from theft alongside the reconstruction needed following damage from shelling.

Table 69. Damage to Vehicles and vehicle spears by Means of Damage (US\$ in Million)

Means Of damage	Damaged Quantity	Damage Value (US\$ in Millions)	Share(%)
Airstrike	6	0.16	0.55
Burning and Looting	28	0.44	1.53
Looting	15463	15.56	54.61
Others	301	1.92	6.74
Shelling	983	10.42	36.57
Total	16781	28.50	100.00

Source: CITG Survey ,2022 and 2023

Damage by Perpetrators

The distribution of damage perpetrators shows that the Eritrean Defense Forces (EDF) caused the single highest financial loss to agricultural vehicles, accounting for US\$ 8.85 million, or 31.05 percent of the total damage, and were responsible for the destruction of 10,215 units. Ethiopian National Defense Force (ENDF) caused US\$ 6.30 million (22.09 percent), and Combined Forces were responsible for US\$ 6.36 million (22.33 percent). Collectively, these three categories account for over 75 percent of the total financial loss. Other forces, including the AMF (16.75 percent) and IRF (2.49 percent), contributed the remaining significant shares.

Table 70. Damage to Vehicles and vehicle spears by Damage Perpetrators (US\$ in Million)

Pperpetrators	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
AMF	516	4.78	16.75
Combined Forces	1462	6.36	22.33
EDF	10215	8.85	31.05
ENDF	3150	6.30	22.09
ENDF_EDF	1415	1.51	5.29
IRF	23	0.71	2.49
Total	16781	28.50	100.00

Source: CITG Survey ,2022 and 2023

Damage to Durable Properties of Agriculture sector

The damage to durable properties systematically targeted the fundamental components of the agricultural economy and civilian life, reflecting a comprehensive stripping of assets. The largest physical losses were concentrated in productive farming assets, including an overwhelming quantity of agricultural tools and machineries, alongside specialized poultry farm tools and machineries, and beehive and accessories. Beyond these core implements, the destruction extended significantly into critical support infrastructure and logistics, specifically impacting construction materials necessary for future rebuilding, as well as essential irrigation materials, motor pumps, and various spare parts and tires. Furthermore, the sheer volume of destruction included essential household and institutional assets, such as beds, chairs, shelves, mattresses, small home equipment, refrigerators, and generators. This extensive range of damaged property from highly specialized farming equipment to basic personal and dwelling necessities underscores the pervasive and systematic nature of asset removal across the entire agricultural support system.

Damage Type

The analysis of damage type inflicted upon durable properties shows that the overwhelming majority of financial loss is attributed to looting. Looted property accounts for US\$ 2177.34 million, representing 90.23 percent of the total US\$ 2413.11 million in damage value. The second-largest category is "Combined & Others," which contributes US\$ 197.99 million, or 8.20 percent of the total damage. Damage caused by burning and breaking are financially minor by comparison, together accounting for less than two percent of the total loss. This distribution indicates that theft and removal of valuable assets, rather than physical destruction, is the predominant mechanism of loss for durable agricultural properties.

Table 71. Damage to Durable Properties by Damage Type (US\$ in Million)

Damage Type	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Broken	962	3.40	0.14
Burned	63272	34.37	1.42
Combined & Others	140130	197.99	8.20
Looted	975133	2177.34	90.23
Total		2413.11	100.00

Source: CITG 2022,2023

Damage Severity Level

The severity assessment for durable agricultural properties shows an extremely high rate of catastrophic loss. Complete Damage accounts for US\$ 2107.38 million, representing 87.33 percent of the total financial damage. Moderate Damage is the next largest category at US\$ 185.51 million (7.69 percent), followed by Severe Damage at US\$ 115.51 million (4.79 percent). Minor Damage is negligible, contributing only 0.23 percent of the loss. This overwhelming concentration of damage in the "complete" category is consistent with the finding that looting and asset removal were the main forms of destruction, resulting in a near-total loss of the property's productive and financial value.

Table 72. Damage to Durable Properties by Damage Severity Level (US\$ in Million)

Damage Severity Level	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Complete Damage	960575	2107.38	87.33
Minor Damage	30059	4.72	0.20
Moderate Damage	174299	185.51	7.69
Severe Damage	14564	115.51	4.79
Total		2413.11	100.00

Source: CITG 2022,2023

Means of Execution of Damage

The means by which damage was executed on durable agricultural properties reveals a reliance on activities associated with mass removal and theft. Burning and Looting, as a combined means, is the largest financial contributor, amounting to US\$ 2052.08 million and representing 85.04 percent of the total damage. Standalone Looting is the next largest contributor at US\$ 237.89 million (9.86 percent). Together, these looting-related acts account for over 94 percent of the financial destruction. Damage caused by shelling, a form of direct combat, accounts for 2.77 percent (US\$ 66.80 million), while airstrikes caused less than one percent of the financial loss, underscoring that the primary means of damage was theft and organized removal of assets rather than explosive force.

Table 73. Damage to Durable properties by Means of Damage (US\$ in Million)

Means Of damage	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Airstrike	22711	22.17	0.92
Burning and Looting	711004.2	2052.08	85.04
Looting	328464	237.89	9.86
Others	38345	34.17	1.42
Shelling	78972.8	66.80	2.77
Total		2413.11	100.00

Source: CITG 2022,2023

Damage by Perpetrators

The attribution of damage to durable properties indicates a high concentration of financial responsibility among the primary actors. The Eritrean Defence Forces (EDF) are attributed with the highest financial damage, accounting for US\$ 1,132.42 million, which is 46.93 percent of the total loss. The second-highest share is attributed to Combined Forces/Others at US\$ 911.94 million (37.79 percent). Together, these two categories account for over 84 percent of the total financial damage. The Ethiopian National Defence Force (ENDF) contributed 7.19 percent (US\$ 173.49 million), and the Amhara Forces contributed 5.85 percent (US\$ 141.25 million), with other smaller groups accounting for the remainder

Table 74. Damage to Durable properties by Damage Perpetrators (US\$ in Million)

Perpetrators	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Amhara Forces	89522.8	141.25	5.85
Combined Forces/Others	182273	911.94	37.79
EDF	654499	1132.42	46.93
ENDF	161190.2	173.49	7.19
ENDF & EDF	64365	17.81	0.74
Irregular Armed Forces	27647	36.20	1.50
Total		2413.11	100.00

Source: CITG 2022,2023

To sum up, the total loss of durable agricultural properties, valued at US\$ 2,413.11 million, is characterized by a high-value, high-severity pattern of asset stripping. The predominant damage type is looting (89.69 percent share), executed mainly through the combined act of burning and looting (84.06 percent share). This financial destruction overwhelmingly resulted in Complete Damage, which accounts for 87.39 percent of the total financial loss, confirming that assets were, for the most part, entirely destroyed or removed. Attribution for this damage is concentrated, with the Eritrean Defence Forces (EDF) and the Combined Forces/Others being responsible for over 84 percent of the total financial damage. This comprehensive result highlights that the recovery challenge for durable properties is primarily one of wholesale replacement necessitated by widespread theft and complete loss, rather than simple repair from combat-related destruction.



Parts of Damaged Tractors in Raya Azebo Woreda, Tigray (Case development)

Consumables' Damage Values by Perpetrators, Execution, Severity and Damage Type

Out of the reported consumable damage values (US\$231.63 million), all combined forces (US\$147.38 million) and both ENDF & EDF together (US\$60.32 million) followed by ENDF alone (US\$18.36 million) and EDF alone (US\$4.56 million) were the leading perpetrators of the consumable damages (Table 75). Majority of the consumables were looted (N=2242/2543) and damaged using various methods like ground artillery bombardments and others (N=198/2543). Almost all of the consumables (N=2436/2543) were completely damaged (Figure 6).

Table 75: Damage Value of Consumables by Perpetrators (US\$ in Millions)

Perpetrators	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
AMF	91564.5	0.59	0.25
Combined Forces	728039.8	147.38	63.62
EDF	107810.3775	4.56	1.97
ENDF	191369	18.36	7.93
ENDF_EDF	321457.55	60.32	26.04
IRF	16246	0.44	0.19
Total		231.63	100.00

Source: CITG 2022,2023

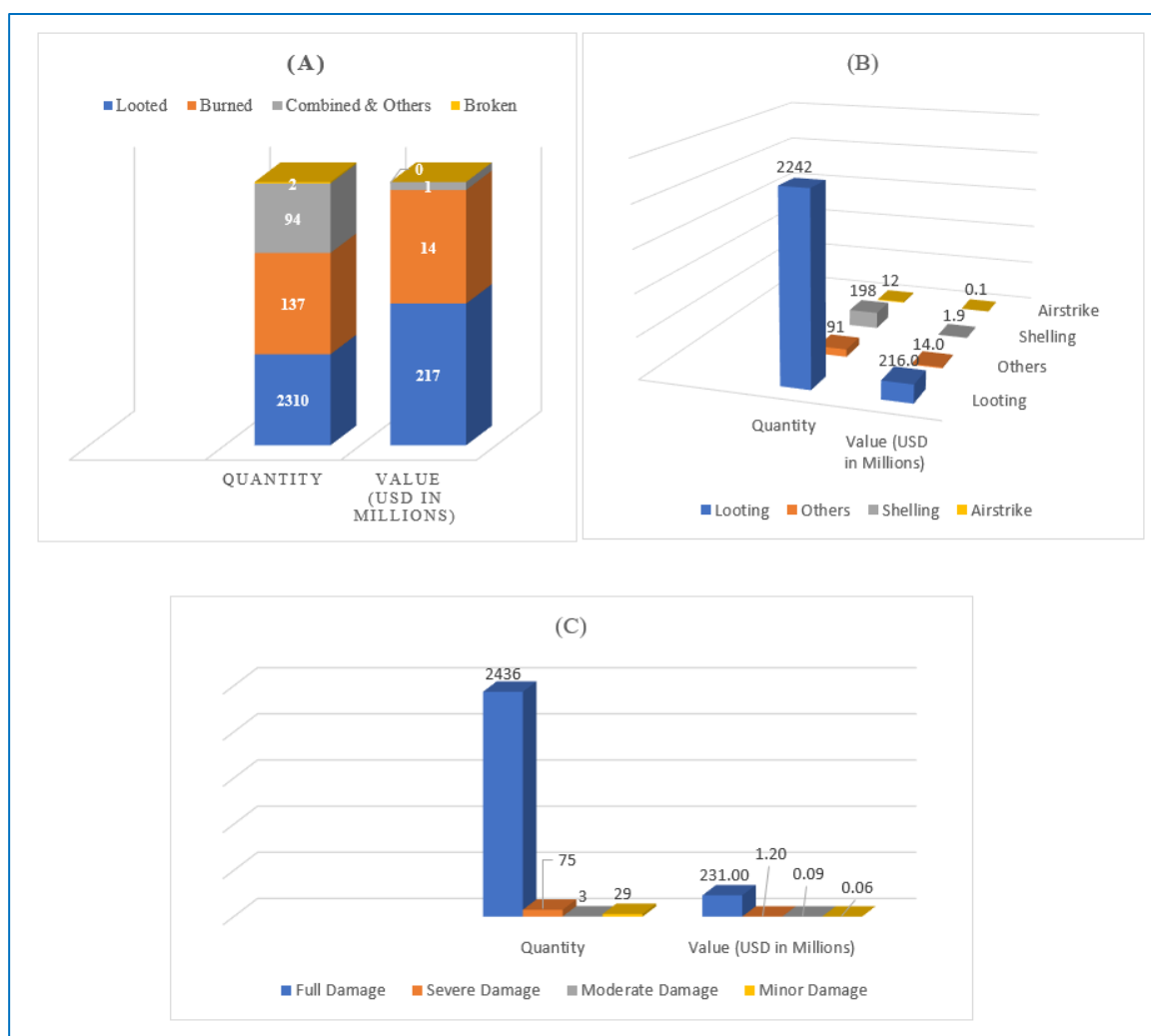


Figure 6: Damaged Consumables (A), Damage Type, (B) Execution Type and (C) Damage Severity

Perpetrators, Execution type and Severity of damage of Artificial insemination (AI) equipment

Artificial Insemination (AI) service is a vital component of dairy development, a service supported in Tigray by 103 institutionalized AI service delivery centers. The recent war resulted in the complete destruction of AI equipment valued at a total of US\$0.79 million (Table 76). The financial damage was highly concentrated among a few critical items. Liquid Nitrogen (LN₂) containers were the most significantly impacted, accounting for nearly half of the total monetary loss at US\$0.35 million, or 43.94% of the total damage value. The second-highest loss was attributed to AI gloves, valued at US\$0.11 million (13.58%). Other items also incurred substantial damage, including Hormone (PGF₂ alpha) and Forceps, each valued at US\$0.06 million (7.96 % and 7.06%, respectively). The destruction of LN₂ containers alone

represented the single greatest financial setback, underscoring the severe impact on the region's AI service infrastructure.

Table 76: Type, quantity, monetary value, frequency and proportion of damage AI equipment

Categories of AI	Damaged Quantity	Damage Value (US\$ in Million)	Share(%)
Heart girth	20	0.00	0.05
AI Case book	54	0.00	0.07
AI certificate	243	0.00	0.26
AI glove	23561	0.11	13.58
AI leather kit (Bag)	803	0.02	2.57
AI sheath	13764	0.02	2.02
Alcohol	80	0.00	0.24
Bull Semen	8660	0.02	2.11
Canister	70	0.00	0.06
Cotton	920	0.02	2.20
Diesel stove	23	0.00	0.14
Ear tag	5280	0.01	1.25
Electrical stove	104	0.01	0.65
Field bag	3	0.00	0.01
Forceps	550	0.06	7.06
Funnel	59	0.00	0.11
Hormone (PGF2 alpha)	4002	0.06	7.96
Insemination gun(AI gun	266	0.01	0.88
LN2 container	846	0.35	43.94
Measuring road	37	0.00	0.08
Mobile tablet	7	0.00	0.53
Motor cycle (in type)	12	0.03	3.75
Pico Projector	9	0.01	1.01
Rain coat	435	0.02	2.27
Disinfectants	486	0.01	0.66
Scissors	490	0.04	4.73
Sheath holder	7080	0.01	0.89
Speaker	4	0.00	0.01
Straw cutter	557	0.00	0.06
Syringe	353	0.00	0.05
Thermometer	195	0.00	0.39
Thermos flask	118	0.00	0.41
Total		0.79	100.00

Source: CITG 2022, 2023

As indicated in Figure 7 economic damage value reveals a clear and concerning causal chain behind the US\$0.79 million in AI equipment damage. The primary responsibility for this damage value is attributed to the EDF, which is the single largest damage value perpetrator at US\$0.37 million (47.51% of the total). This loss was inflicted overwhelmingly through Shelling, the most destructive means of damage, accounting for US\$0.66 million 83.92% of the total). The result of this shelling activity manifested predominantly as the Combined & Others damage type, which represents the largest category of loss at US\$0.44 million (55.70%). Critically, the financial damage is almost entirely concentrated in the Full Damage severity level, meaning the entire US\$0.79 million represents a total write-off for the AI equipment infrastructure. This pattern suggests that military bombardment by the largest contributing

force was the key factor leading to widespread, multifaceted, and irreversible destruction of the high-value equipment.

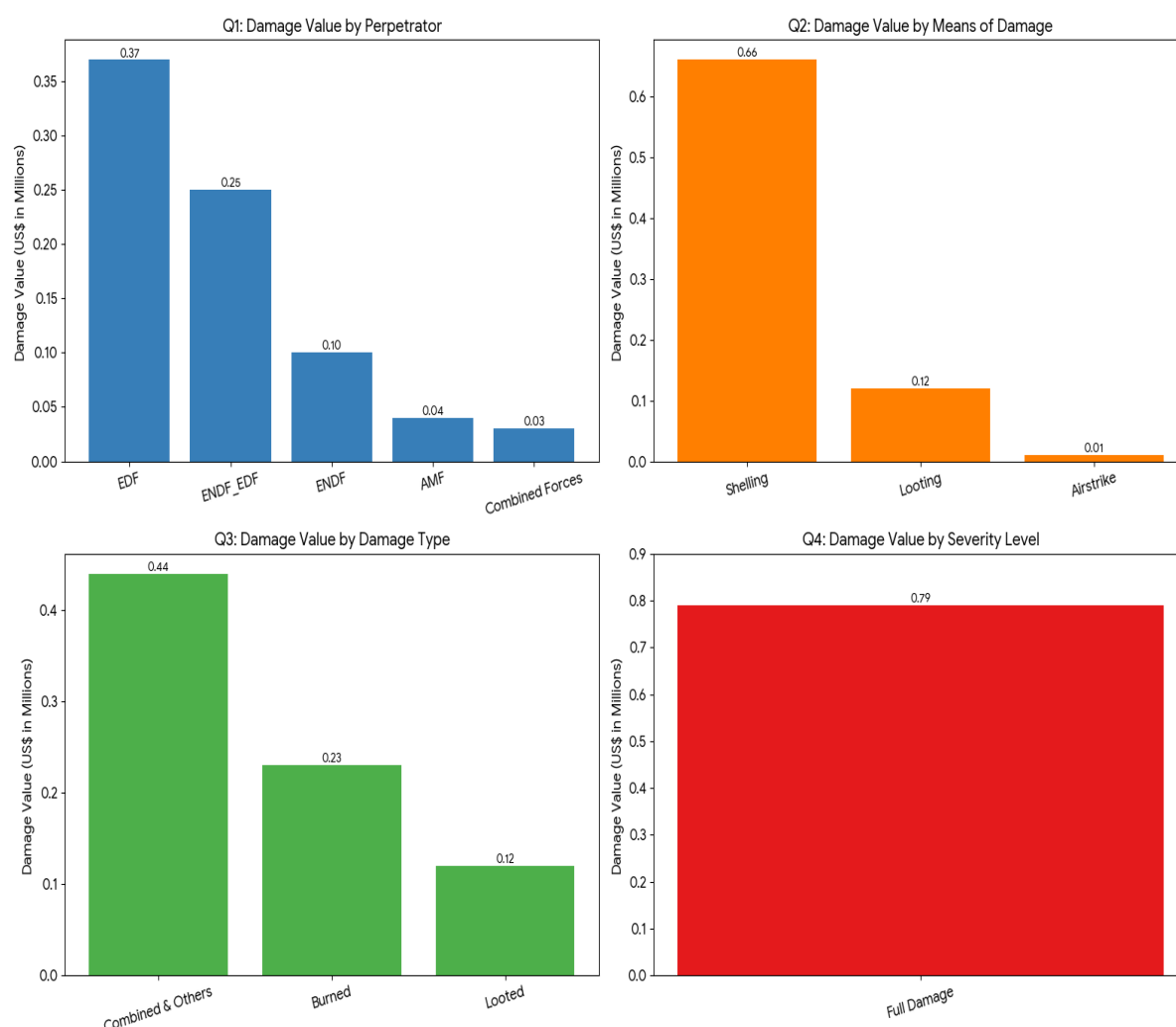


Figure 7: Perpetrators, Damage type, Means of Damage and Damage severity level of AI equipment (US\$ in Millions)

Damage value, Perpetrators, Execution type and Severity of damage of Veterinary clinics and facilities

A total of 106 veterinary clinics were damaged. As stated in the

Table 77, the agricultural sector in Tigray also sustained severe damage to its veterinary drugs, equipment, and supplies, with the total loss valued at US\$2.91 million. This financial devastation was driven by specific means of attack and resulted in overwhelmingly complete damage, threatening the region's animal health infrastructure.

Table 77. Damage of Veterinary properties by Damage type, Damage severity, Perpetrators and Means of Damage (US\$ in Millions)

Categories	Quantity Damaged⁹	Damage Value (US\$ in Million)	Share (%)
Veterinary drugs, equipment, and supplies	5084752	2.91	100.00
Damage Type	Damaged Quantity	Damaged Value (US\$ in Millions)	Share (%)
Broken	3442065	2.32	79.80
Burned	847592	0.56	19.13
Combined & Others	794314	0.02	0.59
Looted	781	0.01	0.48
Grand Total		2.91	100.00
Means of damage	Damaged Quantity	Damaged Value (US\$ in Millions)	Share (%)
Airstrike	202882	0.07	2.35
Looting	1668594	0.76	26.18
Others	583244	0.37	12.56
Shelling	2630032	1.71	58.90
Total		2.91	100.00
Damage Severity Level	Damaged Quantity	Damaged Value (US\$ in Millions)	Share (%)
Full Damage	4981859	2.84	97.66
Minor Damage	41718	0.00	0.13
Moderate Damage	44614	0.03	0.98
Severe Damage	16561	0.04	1.24
Total		2.91	100.00
Perpetrators	Damaged Quantity	Damaged Value (US\$ in Millions)	Share (%)
AMF	3109	0.00	0.15
Combined	156233	0.06	2.04
EDF	3365668	1.92	65.89
ENDF	589374	0.48	16.64
ENDF_EDF	940427	0.43	14.80
IRF	29941	0.01	0.47
Total		2.91	100.00

Source: CITG 2022,2023

The largest portion of the financial damage is attributed to the EDF, which is responsible for US\$1.92 million, constituting 65.89% of the total loss. The next highest financial loss is attributed to the ENDF (US\$0.48 million or 16.64%) and ENDF_EDF forces together (US\$0.43 million or 14.80%). This distribution clearly identifies the primary actors in the destruction of these crucial assets.

⁹ The quantity damaged of veterinary drugs and supplies is measured using different units, making it difficult to aggregate these figures. Therefore, we present the simple sum to show the total quantity.

The means of damage were highly destructive, with Shelling accounting for the largest financial impact at US\$1.71 million, representing 58.90% of the total damage value. Looting was the second most costly means, responsible for US\$0.76 million (26.18%). In terms of the resulting damage type, Broken items represent the vast majority of the loss at US\$2.32 million (79.80%), followed by Burned items at US\$0.56 million (19.13%). The damage was severe: Full Damage accounted for US\$2.84 million, which is 97.66% of the total damage value, indicating that virtually none of the compromised assets are salvageable.



Damaged Public Veterinary Clinic in Samre Woreda, Tigray.

The near-total destruction of veterinary drugs and supplies has profound implications for Tigray's agricultural sector:

- **Animal Health Crisis:** The loss of nearly US\$3 million worth of supplies, particularly to Full Damage, severely compromises the region's capacity to control and prevent livestock diseases. This will likely lead to increased mortality, reduced productivity, and potential zoonotic disease outbreaks, impacting both food security and human health.
- **Dairy Development Setback:** The lack of essential veterinary services directly impedes efforts in livestock and dairy development, reversing gains made in breeding and health management programs.
- **Recovery Hurdle:** Since the majority of the damage was caused by Shelling and resulted in Full Damage, recovery requires immense financial investment for the complete replacement of high-value assets rather than simple repairs. The concentration

of damage by specific perpetrators provides clear indicators for accountability and future mitigation efforts.

Damage value, Perpetrators, Execution type and Severity of Damage of Animals

A total of more than half a million of about 14 different species of animals owned by both private and public entities were reported to be damaged. Of these animals, Cattle (N=18,697) followed by chickens (N=540,725) were the top two most affected animal species, with a monetary value of US\$23.34 million and US\$3.82 million, respectively (Table 78).

Table 78: Damage of Animals by animal categories and Damage Value (US\$ in Million).

Animal Categories ¹⁰	Quantity Damaged	Damage values (Million US\$ in Millions)	Share (%)
Bee colony	32789	3.65	7.44
camel	3714	5.75	11.72
cat	395	0.01	0.03
cattle	18697	23.34	47.59
Chicken	540725	3.82	7.78
dog	1157	0.11	0.23
donkey	236	0.08	0.16
Fish	56	0.05	0.11
goats	17168	3.31	6.75
horse	245	0.13	0.26
mule	5252	0.48	0.98
Others	12249	3.90	7.95
Pig	130	0.03	0.05
sheep	34193	4.39	8.94
Total		49.05	100.00

Source: CITG, 2022 and 2023

¹⁰ This animal category refers to livestock owned by private sector owners before the war, and the respective number of animals damaged during the conflict. Household-owned animals are not included in this category; data for those animals can be accessed from the Economic Research Centre, under the Household and Livestock Department. Details regarding damage to specific livestock or animal breed categories and the effect on the breeds are available from the Natural Resources and Environment Research Centre, under the Livestock Department



Dead bodies of high value and Pure Blood level Dairy Animals in Raya Azebo, Tigray

In Table 79 breakdown of the damage inflicted on animals in the Tigray region, amounting to a total monetary value of over US\$ 49.05 million for 667,006 damaged animals. The data reveals that the overwhelming majority of this damage is attributed to looting and is categorized as full damage, with the Eritrean Defense Force (EDF) being the primary accountable party in terms of monetary value.

Table 79. Damage to Animals by Perpetrators, Execution type and Severity (US\$ in Million)

Damage Type	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Broken	387	0.09	0.19
Burned	16636	2.49	5.07
Combined & Others	132906	4.89	9.97
Looted	517077	41.58	84.77
Total	667006	49.05	100.00
Means of Damage	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Airstrike	3879	0.74	1.50
Burning and Looting	2867	0.63	1.29
Looting	560347	39.78	81.11
Others	55303	3.84	7.82
Shelling	44610	4.06	8.27
Total	667006	49.05	100.00
Damage Severity Level	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Full Damage	665809	48.62	99.12
Minor Damage	257	0.06	0.12
Moderate Damage	318	0.01	0.02
Severe Damage	622	0.36	0.73
Total	667006	49.05	100.00
Perpetrators	Damaged Quantity	Damage Value (US\$ in Millions)	Share(%)
AMF	24641	3.90	7.95
Combined Forces	254068	13.24	26.99
EDF	133875	17.33	35.33
ENDF	144521	10.63	21.68
ENDF & EDF	22242	1.54	3.15
IRF	87659	2.41	4.90
Total	667006	49.05	100.00

Source: CITG Survey ,2022&2023

Damage Type

The economic damage to animals in Tigray is heavily concentrated in one category, highlighting a deliberate pattern of economic plunder. The vast majority of the financial loss, totalling US\$ 41.58 million, is attributed to Looted animals, which accounts for 84.77% of the total damage value. This indicates that the primary economic impact was the outright theft and removal of valuable animal assets. The remaining losses are significantly smaller, with the "Combined & Others" category representing the second-highest damage at US\$ 4.89 million (9.97% of the total), followed by losses from Burned animals, which totalled US\$ 2.49 million (5.07%). This distribution underscores that systematic theft, rather than direct combat damage, was the main driver of the financial destruction of livestock in the region.

Table 80. Damage to Animals by Perpetrators, Execution type and Severity (US\$ in Million)

Damage Type	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Broken	387	0.09	0.19
Burned	16636	2.49	5.07
Combined & Others	132906	4.89	9.97
Looted	517077	41.58	84.77
Total	667006	49.05	100.00

Source: CITG Survey ,2022&2023

Means of Damage Analysis

The analysis of the means of damage strongly mirrors the damage type, confirming the overwhelming prominence of theft as the primary destructive method. Looting stands out as the dominant means, valued at US\$ 39.78 million, which represents 81.11% of the total damage value. The next highest direct combat-related means, Shelling, accounts for a significantly smaller amount at US\$ 4.06 million, or 8.27%. The "Others" category follows with US\$ 3.84 million, accounting for 7.82%. Monetary losses from Airstrikes and Burning and Looting are comparatively minor, underscoring the critical finding that organized theft was a far greater financial drain on animal assets than losses incurred directly from battlefield engagements.

Table 81. Damage to Animals by Perpetrators, Execution type and Severity (US\$ in Million)

Means of Damage	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Airstrike	3879	0.74	1.50
Burning and Looting	2867	0.63	1.29
Looting	560347	39.78	81.11
Others	55303	3.84	7.82
Shelling	44610	4.06	8.27
Total	667006	49.05	100.00

Source: CITG Survey ,2022&2023

Damage Severity Level

The severity analysis highlights the non-recoverable nature of the losses, with the category of Full Damage accounting for almost the entirety of the monetary destruction. This single category totals an overwhelming US\$ 48.62 million, or 99.12% of the total damage value. This signifies that the affected animals were either killed, stolen, or otherwise rendered completely useless to their owners, resulting in a total loss of capital for the livestock owners. In stark contrast, the monetary values for Minor, Moderate, and Severe Damage are negligible, collectively confirming that the losses incurred by affected animal assets were near-total.

Table 82. Damage to Animals by Perpetrators, Execution type and Severity (US\$ in Million)

Damage Severity Level	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Full Damage	665809	48.62	99.12
Minor Damage	257	0.06	0.12
Moderate Damage	318	0.01	0.02
Severe Damage	622	0.36	0.73
Total	667006	49.05	100.00

Source: CITG Survey ,2022&2023

Damage by Perpetrators

The monetary accountability for the damage to animals is distributed primarily among three major actors involved in the war. The Eritrean Defense Force (EDF) accounts for the largest single share of the financial loss, totalling US\$ 17.33 million (35.33%). This is followed by the Combined Forces, which are responsible for US\$ 13.24 million (26.99%), and the Ethiopian National Defense Force (ENDF), which is accountable for US\$ 10.63 million (21.68%). Collectively, these top three perpetrators account for approximately 84% of the total monetary damage to animals. This significant concentration suggests a widespread and systemic pattern of destruction or appropriation of livestock carried out by the major armed groups involved in the Tigray war.

Table 83. Damage to Animals by Perpetrators, Execution type and Severity (US\$ in Million)

Perpetrators	Damaged Quantity	Damage Value (US\$ in Millions)	Share(%)
AMF	24641	3.90	7.95
Combined Forces	254068	13.24	26.99
EDF	133875	17.33	35.33
ENDF	144521	10.63	21.68
ENDF & EDF	22242	1.54	3.15
IRF	87659	2.41	4.90
Total	667006	49.05	100.00

Source: CITG Survey ,2022&2023

Damage value, Perpetrators, Execution type and Severity of damage of Animal products

According to Table 84 from the CITG Survey (2022 & 2023), a total of 1,825,501 units of animal products were damaged, resulting in a financial loss of US\$211.91 million. Butter overwhelmingly dominated the damage, with 1,441,653 units destroyed valued at US\$208.91 million, accounting for 98.59% of the total loss and highlighting its extreme vulnerability in the affected supply chain. The next most significant contributor was fattened animals, with 4,477 units damaged worth US\$1.54 million (0.72% share), followed by beef meat (1,203 units, US\$0.48 million, 0.23%), milk (80,081 units, US\$0.31 million, 0.15%), sheep meat (4,349 units, US\$0.17 million, 0.08%), and fish meat (3,175 units, US\$0.15 million, 0.07%). Despite large quantities affected such as 174,349 units of hide and skin (US\$0.08 million, 0.04%), 75,609 eggs (US\$0.02 million, 0.01%), and 23,350-day-old day-old chicks (US\$0.04 million, 0.02%) these items contributed minimally to the overall financial impact due to their low unit values. Several products, including calf crop, camel calf, camel meat, milk powder, table eggs, and yoghurt, registered near-zero damage values (collectively under US\$0.02 million). The "others" category, comprising 1,118 units, added US\$0.12 million (0.06%) to the total. Overall, while physical damage was widespread across diverse animal products, the economic loss was highly concentrated in butter, underscoring the need to prioritize protection of dairy processing and storage infrastructure, followed by livestock fattening and beef supply chains, to mitigate future risks.

Table 84: Animal Product by Damage Value (US\$ in Millions)

Animal Products	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Butter	1441653	208.91	98.59
Calf crop	34	0.01	0.00
Camel calf	15	0.00	0.00
Camel meat	9	0.00	0.00
Cheese	1376	0.03	0.02
Chicken meat	900	0.02	0.01
day-old chicks	23350	0.04	0.02
Eggs	75609	0.02	0.01
Fattened animals	4477	1.54	0.72
Fish meat	3175	0.15	0.07
Hide and skin	174349	0.08	0.04
Honey	1136	0.02	0.01
Meat (beef)	1203	0.48	0.23
Milk	80081	0.31	0.15
Milk powder	82	0.00	0.00
Sheep meat	4349	0.17	0.08
Table eggs	11000	0.00	0.00
Yoghurt	1585	0.00	0.00
Others		0.12	0.06
Total		211.91	100.00

Source: CITG Survey, 2022&2023

Damage Type

Based on Table 85 from the CITG Survey (2022 & 2023), animal products worth a total of US\$211.91 million were damaged through three primary modes: looting, combined actions and others, and burning. Looting emerged as the dominant damage type, affecting 1,266,968 units and accounting for US\$139.60 million in economic damage value representing 65.88% of the total financial damage. Combined actions and others ranked second, impacting 537,712 units with a value of US\$70.93 million (33.47% share), indicating a significant portion of destruction resulted from multiple or unspecified concurrent methods. In contrast, burning caused relatively minor damage, destroying 20,821 units valued at US\$1.38 million a mere 0.65% of the total loss. This distribution underscores that looting was the primary mechanism of economic harm, responsible for nearly two-thirds of the financial impact, while burning played a negligible role despite involving physical destruction. The heavy reliance on looting and combined methods suggests systematic removal or diversion of high-value animal products particularly butter, which dominated overall damage value of animal products in related assessments rather than outright destruction through fire.

Table 85. Damage of Animal Products by damage type (US\$ in Millions)

Damage Type	Damaged Quantity	Damage Value (US\$ in millions)	Share (%)
Burned	20821	1.38	0.65
Combined & Others	537712	70.93	33.47
Looted	1266968	139.60	65.88
Total		211.91	100.00

Source: CITG Survey, 2022&2023

Means of damage Analysis

According to Table 86 from the CITG Survey (2022 & 2023), looting inflicted the highest damage to animal products at US\$88.73 million (41.87% share), affecting 909,933 units, while shelling ranked second with US\$74.28 million (35.05%) across 479,317 units—together causing over 76% of the total financial loss. In contrast, burning and looting combined resulted in the least damage at US\$0.00 million despite involving 846 units, likely due to low-value items or incomplete valuation. Other means included others (US\$46.19 million, 21.80%) and airstrike (US\$2.71 million, 1.28%), highlighting that removal through looting and destruction via artillery were the dominant mechanisms of animal product damage.

Table 86. Damage of Animal Products by Means of Damage (US\$ in Millions)

Means of Damage	Damaged Quantity	Damage Value (US\$ in millions)	Share (%)
Airstrike	14435	2.71	1.28
Burning and Looting	846	0.00	0.00
Looting	909933	88.73	41.87
Others	420970	46.19	21.80
Shelling	479317	74.28	35.05
Grand Total	1825501	211.91	100.00

Source: CITG Survey, 2022&2023

Damage Severity level

Table 87 indicates that full damage overwhelmingly dominated the loss profile, accounting for US\$211.91 million (99.97% share) across 1,825,341 units, meaning nearly all damaged animal products were completely destroyed or rendered unusable. The least severe category, moderate damage, contributed negligibly with only US\$0.07 million (0.03%) from just 160 units. This near-total severity underscores that the destruction was not partial or repairable but systematically absolute, leaving virtually no recoverable value in the affected inventory.

Table 87. Damage of Animal Products by Damage Severity Level (US\$ in millions)

Damage Severity Level	Damaged Quantity	Damage Value (US\$ in millions)	Share (%)
Full Damage	1825341	211.84	99.97
Moderate Damage	160	0.07	0.03
Grand Total	1825501	211.91	100.00

Source: CITG Survey, 2022&2023

Damage by Perpetrators

As detailed in Table 88, combined forces were the primary perpetrators, responsible for US\$136.56 million (64.44% share) in damage across 966,797 units, followed by ENDF acting alone with US\$52.31 million (24.68%) and 437,352 units meaning ENDF involved actions (joint and independent) caused nearly 89% of the total destruction of animal products. The EDF contributed US\$23.03 million (10.87%), while the least responsible was the IRF, inflicting just US\$0.02 million (0.01%) on 872 units. This distribution reveals that coordinated multi-actor operations, predominantly involving ENDF, were the driving force behind the massive scale of damage.

Table 88. Damage of Animal product by Perpetrators (US\$ in Millions)

Perpetrators	Damaged Quantity	Damage Value (US\$ in millions)	Share (%)
Combined	966797	136.56	64.44
EDF	420480	23.03	10.87
ENDF	437352	52.31	24.68
IRF	872	0.02	0.01
Total	1825501	211.91	100.00

Source: CITG Survey, 2022&2023

Perpetrators, Execution type and Severity of damage of Cereals

According to Table 89 from the CITG Survey (2022 & 2023), a total of 511,232 units of cereals were damaged, resulting in a monetary loss of US\$52.42 million. Sorghum suffered the highest damage by far, with 223,432.5 units destroyed valued at US\$25.98 million—accounting for 49.55% of the total loss and establishing it as the most critically affected cereal. Teff ranked second, with 189,946.85 units damaged worth US\$17.31 million (33.02% share), confirming its status as another high-value, high-volume target. Wheat placed third with 17,404 units lost at US\$1.09 million (2.99%), despite a significantly lower unit volume than sorghum and teff. Other notable but lesser contributions included maize (US\$1.99 million, 3.80%), cotton (US\$1.44 million, 2.75%), and others (US\$1.77 million, 3.37%), while peanut, rice, oat, and finger millet registered near-zero values (collectively under US\$0.02 million). The least impactful category was peanut at US\$0.00 million from just 5 units. Overall, sorghum and teff alone dominated the damage, comprising 82.57% of the total financial loss, underscoring their central role in both production volume and economic value within the affected cereal supply chain.

Table 89. Damage to Cereals by Damage Value (US\$ in millions)

Cereal Categories	Quantity	Damage value (million US\$)	Share (%)
Barely	3072.55	0.29	0.55
Cotton	11075	1.44	2.75
Finger millet	71.6	0.01	0.02
Maize	15282.45	1.99	3.80
Millet	1017.5	0.20	0.38
Oat	102	0.01	0.01
Others	42123.5	1.77	3.37
Peanut	5	0.00	0.00
Rice	35	0.00	0.00
Sorghum	223432.5	25.98	49.55
Taff	189946.85	17.31	33.02
Wheat	17404	1.09	2.09
Wheat and barely	7664.5	1.57	2.99
Total		52.42	100.00

Source: CITG, 2022&2023

Damage Type

The damage of cereals was reported with looting as the overwhelmingly dominant type, affecting 459,367 units and causing US\$47.56 million in losses—representing 90.73% of the total US\$52.42 million damage. Broken cereals ranked a distant second with US\$2.86 million (5.46%) from 28,901 units, followed by burned at US\$1.99 million (3.80%) across 22,935 units. The least impactful was combined & others, contributing US\$0.00 million from just 30

units. This distribution confirms that systematic looting not physical destruction was the primary mechanism of cereal loss, accounting for over 90% of the financial impact.

Table 90. Damage to Cereal products by damage type (US\$ in Millions)

Damage type	Damaged Quantity	Damage Value (US\$ in millions)	Share (%)
Broken	28901	2.86	5.46
Burned	22935	1.99	3.80
Combined & Others	30	0.00	0.00
Looted	459367	47.56	90.73
Total		52.42	100.00

Source: CITG Survey, 2022&2023

Means of Damage

Looting again emerged as the leading means of damage, responsible for US\$46.44 million (88.59% share) across 430,399 units, reinforcing its central role in cereal depletion. Burning and looting combined ranked second with US\$2.94 million (5.61%) from 48,284 units, while airstrike and shelling caused US\$1.25 million (2.38%) and US\$1.21 million (2.30%), respectively. The least significant means was others, at US\$0.58 million (1.11%) from 6,157 units. Collectively, looting—whether standalone or combined drove 94.2% of the total damage value, indicating deliberate removal far outweighed violent destruction methods.

Table 91. Damage to cereal products by Means of damage (US\$ in Millions)

Means of Damage	Damaged Quantity	Damage Value (US\$ in millions)	Share (%)
Airstrike	7834	1.25	2.38
Burning and Looting	48284	2.94	5.61
Looting	430399	46.44	88.59
Others	6157	0.58	1.11
Shelling	18559	1.21	2.30
Total		52.42	100.00

Source: CITG Survey, 2022&2023

Damage Severity Level

Damage was predominantly full, with 507,117 units completely destroyed or looted, valued at US\$51.64 million—a staggering 98.51% of the total loss. Severe damage followed distantly at US\$0.78 million (1.48%) from 4,079 units, while minor damage was negligible at US\$0.01 million (0.01%) from only 37 units. This near-total severity level underscores that virtually all damaged cereal stocks were rendered entirely unusable or irretrievable, leaving minimal scope for salvage or recovery.

Table 92. Damage to Cereal products by Damage severity Level (US\$ in Millions)

Damage Severity Level	Damaged Quantity	Damage Value (US\$ in millions)	Share (%)
Full Damage	507117	51.64	98.51
Minor Damage	37	0.01	0.01
Severe Damage	4079	0.78	1.48
Total		52.42	100.00

Source: CITG Survey, 2022&2023

Damage by Perpetrators

Combined forces were the top perpetrators, inflicting US\$22.79 million (43.48%) in damage across 273,221 units, followed by EDF with US\$12.15 million (23.18%) and 525,20 units, and ENDF alone at US\$7.61 million (14.52%) from 67,587 units. The AMF contributed US\$4.19 million (7.98%), while ENDF & EDF jointly and IRF caused US\$3.50 million (6.68%) and US\$2.18 million (4.16%), respectively. Notably, EDF-involved actions (alone or with ENDF) accounted for nearly 30% of damage, and ENDF-involved actions (solo or joint) totaled over 21%. The least involvement was seen in IRF, but all listed actors played significant roles, with combined and EDF-led operations driving the majority of cereal destruction.

Table 93. Damage to Cereal products by Perpetrators (US\$ in Millions)

Perpetrators	Damaged Quantity	Damage Value (US\$ in millions)	Share (%)
AMF	54911	4.19	7.98
Combined Forces	273221	22.79	43.48
EDF	52520	12.15	23.18
ENDF	67587	7.61	14.52
ENDF & EDF	49358	3.50	6.68
IRF	13637	2.18	4.16
Total		52.42	100.00

Source: CITG Survey, 2022&2023

Perpetrators, Execution type and Severity of damage of Vegetables

Seventeen types and 904.3 million quantities of vegetables were reported to be damaged amounting US\$86.38 million. Of which, red onion (US\$26.23 million) and tomato (US\$22.96 million) were the most damaged vegetables (Table 94).

Table 94: Damage to Vegetables by Damage Value (US\$ in Millions)

Vegetable Categories	Quantity	Damage value (million US\$)	Share (%)
Broklyn	282	0.03	0.03
Cabbage	84248	0.26	0.30
Carrot	1815	0.28	0.32
Cauliflower	18832	1.16	1.35
Eag plant	100	0.00	0.01
Foselia	120	0.01	0.02
Garlic	9736	2.44	2.83
Green pepper	62543	12.35	14.32
Lettuce	266358	10.56	12.25

Vegetable Categories	Quantity	Damage value (million US\$)	Share (%)
Others	28601	7.94	9.20
Potato	2176	0.24	0.28
Red onion	149622	26.19	30.37
Red root	10464	0.02	0.02
Spinach	189	0.03	0.03
Sweet potato	1610	0.27	0.31
Tomato	233310	22.92	26.58
Water melon	34265	1.53	1.78
Total		86.23	100.00

Source: CITG Survey, 2022&2023

Damage Type

Table 95 indicates that, the damage to vegetables was reported with looting as the predominant type, affecting 642,438 units and causing US\$66.73 million in losses accounting for 77.39% of the total US\$86.23 million damage. Combined & others ranked second, impacting 254,544 units with US\$18.22 million (21.12% share), while burned vegetables contributed a minor US\$1.28 million (1.48%) from 7,288 units. This pattern clearly demonstrates that systematic looting, rather than destruction by fire, was the primary driver of vegetable loss, responsible for over three-quarters of the financial impact.

Table 95. Damage to vegetables by damage Type (US\$ in Millions)

Damage type	Damaged Quantity	Damage Value (US\$ in millions)	Share (%)
Burned	7288	1.28	1.48
Combined & Others	254544	18.22	21.12
Looted	642438	66.73	77.39
Total		86.23	100.00

Source: CITG Survey, 2022&2023

Means of Damage

According to Table 96, looting dominated as the leading means of damage, responsible for US\$74.03 million (85.86% share) across 784,820 units, underscoring its role as the near-exclusive mechanism of depletion. Burning and looting combined followed distantly with US\$10.01 million (11.61%) from 102,563 units, while others, shelling, and airstrike caused US\$1.32 million (1.53%), US\$0.87 million (1.00%), and almost none, respectively. Collectively, looting whether standalone or in combination accounted for 97.47% of total damage value, confirming that deliberate removal and diversion vastly outweighed violent or incidental destruction.

Table 96. Damage to vegetables by Means of Damage (US\$ in Millions)

Means of Damage	Damaged Quantity	Damage Value(US\$ in millions)	Share (%)
Airstrike	92	0.00	0.00
Burning and Looting	102563	10.01	11.61
Looting	784820	74.03	85.86
Others	8809	1.32	1.53
Shelling	7986	0.87	1.00
Total		86.23	100.00

Source: CITG Survey, 2022&2023

Damage Severity Level

All reported damage to vegetables was classified as full damage, encompassing 904,270 units valued at US\$86.38 million representing 100.00% of the total loss. No instances of partial, minor, or severe (but recoverable) damage were recorded. This absolute severity indicates that every affected vegetable unit was completely destroyed, looted, or rendered unusable, leaving zero recoverable value in the entire damaged stock.

Damage by Perpetrators

As indicated in Table 97, ENDF emerged as the single largest perpetrator, inflicting US\$26.37 million (30.58% share) in damage across 164,469 units, closely followed by combined forces/others with US\$27.41 million (31.79%) and 350,945 units together making ENDF-involved actions (solo and joint) responsible for over 62% of the loss. EDF ranked third with US\$20.67 million (23.97%) from 256,693 units, while Amhara Forces, ENDF & EDF jointly, and Irregular Armed Forces caused US\$5.21 million (6.04%), US\$4.06 million (4.71%), and US\$2.51 million (2.92%), respectively. The data highlights ENDF and multi-actor coalitions as the dominant forces behind the near-total looting and destruction of vegetable supplies.

Table 97. Damage to vegetables by damage Perpetrators (US\$ in Millions)

Perpetrators	Damaged Quantity	Damage Value (US\$ in millions)	Share (%)
AMF	79753	5.21	6.04
Combined Forces/Others	350945	27.41	31.79
EDF	256693	20.67	23.97
ENDF	164469	26.37	30.58
ENDF & EDF	23577	4.06	4.71
IRF	28833	2.51	2.92
Total		86.23	100.00

Source: CITG Survey, 2022&2023

Perpetrators, Execution type and Severity of damage of Pulses and oilseeds

Table 98 from the CITG Survey (2022 & 2023), a total of 165,678 units of pulse and oilseeds were damaged, resulting in a monetary loss of US\$23.34 million. Sesame suffered the highest damage by a wide margin, with 74,565 units destroyed valued at US\$10.67 million—accounting for 45.70% of the total loss and establishing it as the most severely impacted crop in both volume and value. Haricot bean and the others category tied for second place, each contributing US\$5.66 million and US\$5.65 million (24.25% and 24.23% shares, respectively), with haricot bean affecting 41,298 units and "others" covering 41,254 units of miscellaneous pulses and oilseeds. Faba bean ranked a distant fourth with 7,279 units damaged worth US\$1.04 million (4.45%). The remaining crops registered minimal losses: chickpea (US\$0.16 million, 0.70%), peanut (US\$0.08 million, 0.34%), lentil (US\$0.05 million, 0.22%), beans (US\$0.02 million, 0.07%), and flaxseed (US\$0.01 million, 0.05%). Overall, sesame, haricot bean, and the others category dominated the damage, collectively comprising 94.18% of the total financial loss, highlighting their critical economic importance and vulnerability within the pulse and oilseed sector.

Table 98: Damaged Type of Pulse and Oilseeds by Damage Value (US\$ in millions)

Pulse and Oilseeds	Quantity	Damage values (US\$ in Millions)	Share (%)
Beans	71	0.02	0.07
Chickpea	799	0.16	0.70
Chickpeas/red peas	27	0.00	0.00
Faba Bean	7279	1.04	4.45
Flaxseed	100	0.01	0.05
Haricot bean	41298	5.66	24.25
Lentil	642	0.05	0.22
Others	41254	5.65	24.23
Peanut	643	0.08	0.34
Sesame	74565	10.67	45.70
Total		23.34	100.00

Source: CITG survey, 2022&2023

Damage Type

The damage to pulse and oilseeds was reported with looting as the overwhelmingly dominant type, affecting 153,345 units and causing US\$21.65 million in losses—representing 92.77% of the total US\$23.34 million damage. Burned items ranked a distant second with US\$1.56 million (6.67%) from 12,381 units, while combined & others and broken contributed minimally at US\$0.07 million (0.31%) and US\$0.06 million (0.25%), respectively. This extreme concentration confirms that organized looting, not physical destruction, was the near-exclusive mechanism responsible for over 92% of the financial loss in pulse and oilseed stocks.

Table 99. Damaged Type of Pulse and Oilseeds by Damage Type (US\$ in millions)

Damage Type	Damaged Quantity	Damage Value (US\$ in millions)	Share (%)
Broken	565	0.06	0.25
Burned	12381	1.56	6.67
Combined & Others	360	0.07	0.31
Looted	153345	21.65	92.77
Grand Total		23.34	100.00

Source: CITG Survey, 2022&2023

Means of Damage

Looting dominated as the primary means, accounting for US\$20.91 million (89.59% share) across 146,848 units, reinforcing its role as the central driver of depletion. Others ranked second with US\$1.13 million (4.84%) from 6,518 units, followed by burning and looting combined (US\$0.70 million, 3.01%), airstrike (US\$0.32 million, 1.37%), and shelling (US\$0.28 million, 1.19%). Together, looting—standalone or in combination—caused 92.6% of total damage, indicating systematic removal far surpassed all forms of violent or incidental destruction.

Table 100. Damaged Type of Pulse and Oilseeds by Means of damage (US\$ in millions)

Means of Damage	Damaged Quantity	Damage Value (US\$ in millions)	Share (%)
Airstrike	2428	0.32	1.37
Burning and Looting	5678	0.70	3.01
Looting	146848	20.91	89.59
Others	6518	1.13	4.84
Shelling	5179	0.28	1.19
Total		23.34	100.00

Source: CITG Survey, 2022&2023

Damage Severity Level

Damage was almost entirely full, with 166,446 units completely destroyed or looted, valued at US\$23.28 million a commanding 99.75% of the total loss. Severe damage was negligible at US\$0.06 million (0.24%) from 200 units, and minor damage was virtually non-existent at US\$0.001 million (0.01%) from just 5 units. This near-universal full severity level underscores that practically all affected pulse and oilseed stocks were rendered totally irretrievable.

Table 101. Damaged Type of Pulse and Oilseeds by Damage Severity Level (US\$ in millions)

Damage Severity Level	Damaged Quantity	Damage Value(US\$ in millions)	Share (%)
Full Damage	166446	23.28	99.75
Minor Damage	5	0.00	0.01
Severe Damage	200	0.06	0.24
Grand Total		23.34	100.00

Source: CITG Survey, 2022&2023

Damage by Perpetrators

Combined forces were the leading perpetrators, responsible for US\$12.96 million (55.55% share) across 91,751 units, followed closely by EDF with US\$6.51 million (27.90%) and 45,972 units—meaning EDF-involved actions (solo or joint) accounted for nearly 29.5% of damage. Amhara Forces ranked third with US\$2.12 million (9.08%) from 14,635 units, while ENDF alone contributed US\$1.05 million (4.51%), ENDF & EDF jointly US\$0.36 million (1.55%), and Irregular Armed Forces US\$0.33 million (1.41%). The data clearly identifies multi-actor coalitions and EDF operations as the dominant forces behind the near-total looting and destruction of high-value sesame and haricot bean inventories.

Table 102. Damaged Type of Pulse and Oilseeds by Damage Perpetrators (US\$ in millions)

Perpetrators	Damaged Quantity	Damage Value (US\$ in millions)	Share(%)
AMF	14635	2.12	9.08
Combined Forces	91751	12.96	55.55
EDF	45972	6.51	27.90
ENDF	9480	1.05	4.51
ENDF & EDF	3063	0.36	1.55
IRF	1750	0.33	1.41
Total		23.34	100.00

Source: CITG Survey, 2022&2023

Damage value, Perpetrators, Execution type and Severity of damage of Fruits

In total, 29 types of fruits and trees were damaged during the war amounting US\$201.33 million. The most damaged fruits include, mango (US\$90.1 million) followed by banana (US\$47.3 million) (Table 103).

Table 103: Damaged Types of Fruits by Damage Value (US\$ in Millions)

Fruits Type	Quantity	Damage value (US\$ in Millions)	Share(%)
Acacia	7270	0.00	0.00
Apple	95092	21.61	10.75
Avocado	28645	2.62	1.31
Banana	320165	47.22	23.50
Brocoli	6250	0.44	0.22
Cactus	5775	0.01	0.01
Chat	537	0.06	0.03
Chery tomato	6250	0.44	0.22
Coffee	11765	1.37	0.68

Fruits Type	Quantity	Damage value (US\$ in Millions)	Share(%)
Cordia Africana	1	0.00	0.00
Eucalyptus	6527	0.01	0.01
Elephant grass	2003	0.12	0.06
Enjorey	4	0.00	0.00
Flower	15004	0.00	0.00
Grape	1500	1.41	0.70
Guava	104148	3.66	1.82
Jakal Berry (Aye)	15	0.00	0.00
Lemon	61393	4.89	2.43
Mango	320632	89.91	44.74
Moringa	35	0.02	0.01
Moringa	1640	0.27	0.13
Orange	53283	3.04	1.51
Others	146085	3.16	1.57
Papaya	115945	8.12	4.04
Peanut	75	0.01	0.01
Raspberry	5000	5.52	2.75
Rhamnus prinoides	67774	0.34	0.17
Strawberry	5500	2.58	1.29
Sweet pepper	17500	4.11	2.05
Grand Total		200.98	100.00

Source: CITG Survey, 2022&2023

Damage Type

The damage to fruits was reported with looting as the overwhelmingly dominant type, affecting 1,089,679 units and causing US\$176.73 million in losses representing 87.94% of the total US\$200.98 million damage. Burned fruits ranked a distant second with US\$19.37 million (9.64%) from 105,934 units, while combined & others contributed minimally at US\$4.87 million (2.43%) across 210,199 units. This stark distribution confirms that organized looting, rather than burning or other methods, was the primary driver of fruit loss, responsible for nearly 88% of the financial impact.

Table 104. Damage to Fruits by Damage type (US\$ in Millions)

Damage Type	Damaged Quantity	Damage Value (US\$ in millions)	Share (%)
Burned	105934	19.37	9.64
Combined & Others	210199	4.87	2.43
Looted	1089679	176.73	87.94
Grand Total		200.98	100.00

Source: CITG Survey, 2022&2023

Means of Damage

Looting dominated as the leading means, accounting for US\$174.69 million (86.92% share) across 1,145,317 units, reinforcing its near-total role in fruit depletion. Others ranked second with US\$18.21 million (9.06%) from 99,024 units, followed by shelling (US\$4.19 million, 2.08%), burning and looting combined (US\$3.89 million, 1.93%), and airstrike (US\$0.0047

million, 0.00%). Together, looting standalone or in combination—drove 88.85% of damage value, indicating systematic removal vastly overshadowed all forms of physical destruction.

Table 105. Damage to Fruits by Means of damage (US\$ in Millions)

Means of Damage	Damaged Quantity	Damage Value (US\$ in millions)	Share (%)
Airstrike	40	0.00	0.00
Burning and Looting	67506	3.89	1.93
Looting	1145317	174.69	86.92
Others	99024	18.21	9.06
Shelling	93925	4.19	2.08
Total		200.98	100.00

Source: CITG Survey, 2022&2023

Damage Severity Level

Damage was virtually all full, with 1,404,811 units completely destroyed or looted, valued at US\$200.83 million a commanding 99.93% of the total loss. Severe damage was negligible at US\$0.14 million (0.07%) from 965 units, and minor damage was essentially nonexistent at US\$0.01 million (0.00%) from just 36 units. This near-universal full severity level underscores that practically every affected fruit unit was rendered totally irretrievable, leaving no meaningful recovery potential.

Table 106. Damage to Fruits by Damage Severity Level (US\$ in Millions)

Damage Severity Level	Damaged Quantity	Damage Value (US\$ in millions)	Share (%)
Full Damage	1404811	200.83	99.93
Minor Damage	36	0.01	0.00
Severe Damage	965	0.14	0.07
Total		200.98	100.00

Source: CITG Survey, 2022&2023

Damage by Perpetrators

As indicated in ENDF acting alone and combined forces tied as the top perpetrators, each inflicting US\$60.46 million (30.08%) and US\$60.25 million (29.98%), respectively—meaning ENDF-involved actions (solo or joint) accounted for over 60% of total damage. ENDF & EDF jointly ranked third with US\$38.12 million (18.97%) across 442,540 units, followed by IRF (US\$28.17 million, 14.02%), EDF alone (US\$9.40 million, 4.68%), and AMF (US\$4.58 million, 2.28%). The data clearly identifies ENDF-led operations whether independent, joint with EDF, or in broader coalitions as the dominant force behind the near-total looting and destruction of high-value fruit supplies.

Table 107. Damage to Fruits by Damage Perpetrators (US\$ in Millions)

Perpetrators	Damaged Quantity	Damage Value(US\$ in millions)	Share(%)
AMF	87113	4.58	2.28
Combined Forces	536905	60.25	29.98
EDF	140677	9.40	4.68
ENDF	92370	60.46	30.08
ENDF & EDF	442540	38.12	18.97
IRF	106207	28.17	14.02
Total		200.98	100.00

Source: CITG Survey, 2022&2023

Damage value, Perpetrators, Execution type and Severity of damage of ICT assets and infrastructure

As stated in Table 108 , damage of ICT assets and infrastructure with a monetary value of US\$ 425.22 million were damaged. Of which, majority (99.47%) were Desktop computer and Laptops followed by accessories (0.17%).

Table 108: ICT assets and infrastructure by Damage Value (US\$ in Millions)

Items Damaged	Damaged Quantity	Damage value (US\$ in millions)	Share (%)
CCTV camera	50	0.26	0.06
Accessories	5304	0.71	0.17
Computer/printer	20	0.02	0.00
Connector and Cabling	669	0.60	0.14
Desktop computer & Laptop	102969	422.23	99.47
Hard Disk	296	0.06	0.02
Mobile	203	0.19	0.05
Others	397	0.39	0.09
Printer and Photocopy	23	0.02	0.00
Storage Devices	6	0.00	0.00
Switch board	1	0.00	0.00
System	3	0.00	0.00
Television	2	0.00	0.00
Total		424.47	100.00

Source: CITG Survey, 2022&2023

Damage Type

The damage to ICT assets and infrastructure was almost exclusively driven by looting, which affected 103,578 units and caused US\$422.38 million in losses—representing a staggering 99.51% of the total US\$424.47 million damage. Broken items ranked a remote second with US\$1.71 million (0.40%) from 5,992 units, followed by combined & others (US\$0.21 million, 0.05%) and burned (US\$0.17 million, 0.04%). This extreme skew confirms that organized looting was effectively the only significant mechanism of ICT destruction, accounting for over 99.5% of the financial impact.

Table 109. ICT assets and infrastructure by Damage Type (US\$ in Millions)

Damage Type	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
Broken	5992	1.71	0.40
Burned	29	0.17	0.04
Combined	344	0.21	0.05
Looted	103578	422.38	99.51
Total		424.47	100.00

Source: CITG Survey, 2022&2023

Means of Damage

Shelling emerged as the dominant means, destroying 56,784 units valued at US\$275.74 million (64.96% share), while looting ranked second with US\$148.64 million (35.02%) across 53,079 units. Airstrike and others contributed negligibly at US\$0.10 million (0.02%) and US\$0.00 million (0.00%), respectively. Notably, shelling and looting combined explain 100% of the damage value, revealing a dual-track assault: indiscriminate bombardment of fixed infrastructure (e.g., telecom towers) and targeted looting of portable high-value equipment (e.g., servers, routers).

Table 110. ICT assets and infrastructure by Means of Damage (US\$ in Millions)

Means of damage	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
Airstrike	77	0.10	0.02
Looting	53079	148.64	35.02
Others	3	0.00	0.00
Shelling	56784	275.74	64.96
Total		424.47	100.00

Source: CITG Survey, 2022&2023

Damage Severity Level

Damage was overwhelmingly full, with 109,899 units completely destroyed or looted, valued at US\$424.42 million, 99.99% of the total loss. Severe damage accounted for a mere US\$0.05 million (0.01%) from 43 units, and minor damage was statistically zero (US\$0.00004 million, 0.0001%) from a single unit. This near-perfect totality means virtually every damaged ICT asset was rendered permanently inoperable, leaving zero recoverable functionality.

Table 111. ICT assets and infrastructure by Damage Severity Level (US\$ in Millions)

Damage Severity Level	Quantity Damaged	Damage Value(US\$ in millions)	Share (%)
Full Damage	109899	424.42	99.99
Minor Damage	1	0.00	0.00
Severe Damage	43	0.05	0.01
Grand Total		424.47	100.00

Source: CITG Survey, 2022&2023

Damage by Perpetrators

EDF was the primary perpetrator, responsible for US\$330.46 million (77.85%) across 55,499 units, followed by ENDF & EDF jointly with US\$93.32 million (21.99%) and 52,018 units meaning EDF-involved actions (solo or joint) caused 99.84% of all ICT damage. ENDF alone, combined forces/others, and irregular armed forces played negligible roles at US\$0.10 million (0.02%), US\$0.58 million (0.14%), and US\$0.01 million (0.00%), respectively. The data unequivocally identifies EDF-led operations especially through shelling and joint looting campaigns as the near-exclusive force behind the systematic annihilation of ICT infrastructure.

Table 112. ICT assets and infrastructure by Damage Perpetrators (US\$ in Millions)

Perpetrators	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
Combined Forces	1095	0.58	0.14
EDF	55499	330.46	77.85
ENDF	1319	0.10	0.02
ENDF & EDF	52018	93.32	21.99
IRF	12	0.01	0.00
Total		424.47	100.00

Source: CITG Survey, 2022&2023

Damage value, Perpetrators, Execution type and Severity of damage of Electric assets and infrastructure

More than 27 types of electrical assets and infrastructures amounting US\$ 1.34 billion were damaged (Table 113). Control board (52.12%, US\$ 700 million) and power supply (39.01%, US\$ 524 million) were top two most affected electrical assets and infrastructures (Table 113)

Table 113: Electrical Assets and Infrastructure by Damage Value (US\$ in Millions)

Item Damaged	Quantity Damaged	Damage value (US\$ in Millions)	Share (%)
Accessories	692	0.03	0.00
Body Parts of electrical Equipment's	1108	0.12	0.01
Bread making machine	4	0.01	0.00
Chicken brooder	17	0.00	0.00
Communication	14	0.00	0.00
Communication	410	0.00	0.00
Control Board	270026	698.54	52.11
Divider	7	0.02	0.00
Electric Poles	70	0.00	0.00
Electric power stabilizer	8	0.00	0.00
Electric wire	15257	0.03	0.00
Fuel	800	0.00	0.00
Generator/motor	195	0.96	0.07
Hand tools	3424	0.05	0.00
Input terminal	52714	33.14	2.47
Monitor/Display	7	0.00	0.00
Others	202175	82.92	6.19
Output terminal	2047	0.32	0.02

Power supply	34608	523.14	39.02
Solar light device	435	1.24	0.09
Storage and Memory	1035.4	0.07	0.01
Stove	46	0.01	0.00
Switch bord	2	0.00	0.00
Tape	1	0.00	0.00
Transformer and accessories	3	0.00	0.00
Water Tanker	1	0.00	0.00
Total		1340.61	100.00

Source: CITG Survey, 2022 & 2023

Damage Type

Damage to electrical equipment was overwhelmingly caused by looting, which affected 562,516 units and inflicted US\$1,337.49 million in losses representing 99.77% of the total US\$1,340.61 million damage. Broken equipment ranked a distant second with US\$2.09 million (0.16%) from 19,668 units, followed by burned (US\$0.94 million, 0.07%) and combined & others (US\$0.08 million, 0.01%). This near-total dominance confirms that systematic looting not physical destruction was the primary and almost exclusive mechanism, accounting for over 99.7% of the financial devastation.

Table 114. Damage to Electrical Equipment's by Damage type (US\$ in Millions)

Damage type	Quantity Damaged	Damage Value(US\$ in millions)	Share (%)
Broken	19668	2.09	0.16
Burned	2826	0.94	0.07
Combined & Others	96	0.08	0.01
Looted	562516	1337.49	99.77
Grand Total		1340.61	100.00

Source: CITG Survey, 2022&2023

Means of damage

Looting was the dominant means, responsible for US\$1,151.57 million (85.90% share) across 104,035 units, while airstrike ranked second with US\$163.68 million (12.21%) affecting 368,928 units likely targeting power stations or grid infrastructure. Shelling followed with US\$23.37 million (1.74%), while burning and looting combined, others, and other methods contributed negligibly. Together, looting and airstrike accounted for 98.11% of damage, revealing a two-pronged assault: mass looting of portable high-value equipment (transformers, cables, generators) and aerial bombardment of fixed electrical infrastructure.

Table 115. Damage to Electrical Equipment's by Means of damage (US\$ in Millions)

Means of damage	Quantity Damaged	Damage Value(US\$ in millions)	Share (%)
Airstrike	368928	163.68	12.21
Burning and Looting	2211	1.11	0.08
Looting	104035	1151.57	85.90
Others	2406	0.88	0.07
Shelling	107526	23.37	1.74
Total		1340.61	100.00

Source: CITG Survey,2022&2023

Damage Severity Level

Damage was almost entirely full, with 563,849 units completely destroyed or looted, valued at US\$1,337.76 million, 99.79% of the total loss. Severe damage was minimal at US\$2.14 million (0.16%) from 19,871 units, moderate damage at US\$0.69 million (0.05%), and minor damage virtually zero (US\$0.01 million, 0.00%) from 16 units. This extreme totality means practically all damaged electrical assets were rendered permanently inoperable, leaving no significant repair or salvage potential.

Table 116. Damage to Electrical Equipment's by Damage Severity Level (US\$ in Millions)

Damage Severity Level	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
Full Damage	563849	1337.76	99.79
Minor Damage	16	0.01	0.00
Moderate Damage	1370	0.69	0.05
Severe Damage	19871	2.14	0.16
Total		1340.61	100.00

Source: CITG Survey,2022&2023

Damage by Perpetrators

Combined forces were the primary perpetrators, inflicting US\$1,147.47 million (85.59% share) across 97,340 units, followed by EDF with US\$134.77 million (10.05%) and 377,176 units, and ENDF & EDF jointly with US\$50.97 million (3.80%). ENDF alone contributed US\$7.11 million (0.53%), while AMF and IRF played negligible roles at US\$0.28 million (0.02%) and US\$0.01 million (0.00%). EDF-involved actions (solo or joint) totaled 13.85%, but combined forces likely including multiple actors executed the vast majority of the strategic looting and infrastructure attacks, effectively dismantling the region's electrical grid.

Table 117. Damage to Electrical Equipment's by Damage Perpetrators (US\$ in Millions)

Perpetrators	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
AMF	103	0.28	0.02
Combined Forces/	97340	1147.47	85.59
EDF	377176	134.77	10.05
ENDF	5360.4	7.11	0.53
ENDF & EDF	105073	50.97	3.80
IRF	54	0.01	0.00
Total		1340.61	100.00

Source: CITG Survey, 2022&2023

Damage value, Perpetrators, Execution type and Severity of damage of FTC Assets and Infrastructure

According to Table 118, the total damage to FTC assets and infrastructure amounted to US\$4.84 million across 46,590.3 units. Furniture sustained the highest loss at US\$1.62 million (33.45% share), followed by others at US\$0.65 million (13.52%) and shelves at US\$0.50 million (10.31%). Notable damage also occurred to farm inputs (US\$0.30 million), electronics equipment (US\$0.26 million), and construction materials, honey bee materials, and solar systems, each around US\$0.21 to 0.24 million.

Table 118. Damage to FTC Assets and Infrastructure by Damage value(US\$ in Millions)

FTC Equipment's	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
Ball	241	0.02	0.39
Barrel	86	0.00	0.10
Binecular glass	26	0.01	0.22
Board	2277	0.06	1.33
Cart	584	0.06	1.31
Construction materials	8370	0.24	4.94
Dairy cow and equipment's	467	0.18	3.71
Electronics Equipment's	172	0.26	5.41
Door	237	0.06	1.34
Electronics	305	0.20	4.18
Farm inputs	5613.8	0.30	6.18
Furniture	17001	1.62	33.45
Honey bee and materials	2199	0.21	4.26
Motor pump water	30	0.07	1.41
Farm Motor/cycle	381	0.08	1.67
Others	5814.5	0.65	13.52
Raingage	116	0.00	0.03
Shelf	1408	0.50	10.31
Solar	669	0.24	4.93
Stationary materials	518	0.05	0.97
Wiegthing machine	75	0.02	0.35
Total	46590.3	4.84	100.00

Source: CITG survey, 2022&2023

The heavy financial burden on furniture, storage, and general supplies indicates severe disruption to the core administrative and operational framework of FTCs, necessitating large-scale replacement to restore training and extension activities.

Damage type

Table 119 reveals that of the US\$4.84 million in total damage, the combined & others category dominated with US\$3.74 million (77.19% share across 38,961.3 units), followed by burned assets at US\$0.73 million (15.09%) and looted items at US\$0.36 million (7.54%). Broken items contributed only US\$0.01 million. The overwhelming prevalence of combined and incendiary damage reflects systematic and destructive tactics, likely aimed at erasing functional capacity, which complicates accurate loss assessment and increases the complexity of recovery planning.

Table 119. Damage to FTC Assets and Infrastructure by Damage Type(US\$ in Millions)

Damage Type	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
Broken	134	0.01	0.18
Burned	3661	0.73	15.09
Combined & Others	38961.3	3.74	77.19
Looted	3834	0.36	7.54
Grand Total		4.84	100.00

Source: CITG survey, 2022&2023

Means of damage

As shown in Table 120, shelling was the primary means of destruction, causing US\$2.98 million in damage (61.60% of total value across 30,630 units), followed by looting at US\$1.27 million (26.15%) and airstrikes at US\$0.55 million (11.46%). Other means accounted for just US\$0.04 million. The dominance of artillery-based and opportunistic damage highlights FTCs' vulnerability in active combat zones and during periods of weakened security, underscoring the need for protective measures in future war-prone agricultural development programs.

Table 120. Damage to FTC Assets and Infrastructure by Means of damage (US\$ in Millions)

Means Of damage	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
Airstrike	4308	0.55	11.46
Looting	11099.3	1.27	26.15
Others	553	0.04	0.78
Shelling	30630	2.98	61.60
Total		4.84	100.00

Source: CITG survey, 2022&2023

Damage Severity level

Table 121 indicates that nearly all damage was full, totaling US\$4.74 million (97.99% share across 45,635.3 units), with severe damage at US\$0.09 million (1.84%), moderate at US\$0.01 million (0.16%), and minor damage negligible at US\$0.00 million. The near-complete destruction of assets means that rehabilitation efforts must focus almost entirely on reconstruction rather than repair, significantly raising costs and extending the timeline for restoring agricultural training services.

Table 121. Damage to FTC Assets and Infrastructure by Damage Severity Level(US\$ in Millions)

Damage Severity Level	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
Full Damage	45635.3	4.74	97.99
Minor Damage	25	0.00	0.01
Moderate Damage	496	0.01	0.16
Severe Damage	434	0.09	1.84
Total		4.84	100.00

Source: CITG survey, 2022&2023

Damage by Perpetrators

Table 61 attributes the largest share of damage to the EDF at US\$2.56 million (52.79% across 23,694.3 units), followed by combined forces at US\$1.11 million (22.88%), ENDF & EDF jointly at US\$0.70 million (14.44%), and ENDF alone at US\$0.48 million (9.89%). The significant role of external and joint military actors in damaging civilian agricultural infrastructure points to the regional scope of the war's impact, posing challenges for accountability, cross-border cooperation, and equitable reconstruction support.

Table 122. Damage to FTC Assets and Infrastructure by Damage Perpetrators (US\$ in Millions)

Perpetrators	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
Combined Forces	8244	1.11	22.88
EDF	23694.3	2.56	52.79
ENDF	6769	0.48	9.89
ENDF & EDF	7883	0.70	14.44
Total		4.84	100.00

Source: CITG survey, 2022&2023

Perpetrators, Execution type and Severity of damage of Documents, archives and books

As stated in Table 123, about 41,411 quantities of documents archives and books worthy of US\$0.71 million. However, majority of the highly damaged assets were different rules and regulations (US\$0.25 million), manuals for livestock production (US\$0.19 million) and Protocol files (US\$0.17 million).

Table 123: Damage to Documents, archives and books by Damage value (US\$ in Millions)

Book and Record	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
Different books	3604	0.04	5.29
Different rules & regulations	4886	0.25	35.52
In and out invoice	5284	0.06	8.57
Manuals for farmers training center	403	0.00	0.64
Manuals for livestock production, fattening, health & feeding	12030	0.19	26.27
Others	8	0.00	0.01
Protocol files	15196	0.17	23.70
Grand Total	41411	0.71	100.00

Source: CITG Survey, 2022&2023

Damage type

According to Table 124, the total damage to documents, archives, and books amounted to US\$0.71 million across 41,411 units. Broken items sustained the highest loss at US\$0.42 million (59.55% share), followed by burned materials at US\$0.14 million (20.15%) and combined & others at US\$0.12 million (17.36%). Looted documents contributed only US\$0.02 million (2.94%). The predominance of breakage and burning reflects deliberate targeting of informational resources, resulting in irreversible loss of institutional knowledge and historical records critical for agricultural training continuity.

Table 124. Damage to Documents, archives and books by Damage type (US\$ in Millions)

Damage Type	Quantity Damaged	Damage Value(US\$ in millions)	Share (%)
Broken	14620	0.42	59.55
Burned	12258	0.14	20.15
Combined & Others	13035	0.12	17.36
Looted	1498	0.02	2.94
Total		0.71	100.00

Source: CITG Survey, 2022&2023

Means of damage

Table 125 reveals that shelling was overwhelmingly the primary means of destruction, causing US\$0.68 million in damage (95.44% of total value across 38,171 units), followed by looting at US\$0.03 million (4%) and airstrikes at US\$0.00 million (0.53%). Other means were negligible. Implication: The near-exclusive reliance on shelling indicates that document repositories were collateral or intentional targets during heavy bombardment, underscoring the vulnerability of non-physical infrastructure in war zones.

Table 125. Damage to Documents, archives and books by Means of Damage (US\$ in Millions)

Means of damage	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
Airstrike	634	0.00	0.53
Looting	2558	0.03	4.00
Others	48	0.00	0.03
Shelling	38171	0.68	95.44
Total		0.71	100.00

Source: CITG Survey,2022&2023

Damage Severity level

As shown in Table 126, virtually all damage was full, totaling US\$0.71 million (99.97% share across 41,336 units), with moderate and severe damage each contributing less than US\$0.00 million (0.02% and 0.01%, respectively). The complete obliteration of nearly all recorded materials means that rebuilding FTC knowledge bases will require extensive digitization, reprinting, or reconstruction from external sources, severely delaying educational and advisory functions.

Table 126. Damage to Documents, archives and books by Damage Severity Level (US\$ in Millions)

Damage Severity Level	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
Full Damage	41336	0.71	99.97
Moderate Damage	25	0.00	0.02
Severe Damage	50	0.00	0.01
Total		0.71	100.00

Source: CITG Survey,2022&2023

Damage by Perpetrators

Table 127 attributes the largest share of damage to ENDF & EDF jointly at US\$0.48 million (67.19% across 20,574 units), followed by EDF alone at US\$0.21 million (28.96%), combined forces/others at US\$0.02 million (3.17%), and ENDF alone at US\$0.00 million (0.68%). The dominant role of joint ENDF& EDF operations in destroying documentary assets highlights coordinated military actions with significant cultural and operational consequences, complicating accountability and the preservation of neutral agricultural extension resources.

Table 127. Damage to Documents, archives and books by Damage Perpetrators

Perpetrators	Quantity Damaged	Damage Value(US\$ in millions)	Share (%)
Combined Forces/Others	1843	0.02	3.17
EDF	18206	0.21	28.96
ENDF	788	0.00	0.68
ENDF & EDF	20574	0.48	67.19
Total		0.71	100.00

Source: CITG Survey,2022&2023

Perpetrators, Execution type and Severity of damage of Inputs and Feed

As stated in Table 128, about 49 types and 526,442.01 units of agricultural inputs and feed worth of US\$50.11 million were damaged. Among the damaged agricultural inputs and feed, concentrate feed (US\$36.74 million) and crop residue (US\$2.72 million) were the most affected type of inputs and feed. From this, it can be realized that majority of the damage was on animal feed and associated inputs.

Table 128. Damage to Inputs and Feed by Damage Value (US\$ in Millions)

Inputs	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
Agrochemicals	5569.5	0.36	0.71
Bee colony, beehive, accessories	1347	0.40	0.80
brewery leftover	65055	0.68	1.35
Cactus	156	0.00	0.00
Camel	8330	1.01	2.02
Cattle	6090	0.25	0.49
Chicken	8467	0.48	0.96
Compost	10380	0.02	0.04
Concentrated feed	129481.36	36.67	73.18
Corn	186	0.01	0.02
crop residue	68345.5	2.71	5.41
Dog	2792	0.00	0.01
Donkey	115	0.01	0.02
Eucalyptus tree	300	0.00	0.00
Elephant grass	25	0.00	0.00
feed compost	100	0.02	0.03
feed seed	2821	0.06	0.13
Fish residue	109	0.30	0.59
fodder and green feed	8759	0.33	0.67
Fuel	462	0.21	0.41
Goats	1203	0.02	0.03
Honey	160	0.00	0.01
Horse	2117	0.10	0.20
Improved feed seed	326	0.02	0.03
Local feed seed	324.75	0.01	0.02
Maize	1	0.00	0.00
Molasses	865	0.13	0.26
motor oil	20	0.00	0.00
Mule	1462	0.03	0.06
Nug oil/cake	5039	0.29	0.57
onion improved seed	101	0.01	0.02
Others	137940.15	3.55	7.09
Pepper	415	0.00	0.00
Pullet box	300	0.00	0.00
Salt	4957	0.21	0.43
Seedlings	1317.75	0.02	0.04
Sheep	9213.5	0.44	0.89
Sorghum	200	0.00	0.00
Straw, grass	20390	0.77	1.54
Sugar	375	0.03	0.07
tomato improved seed	10	0.00	0.00
Tractor service	2	0.02	0.04
urea block	38.5	0.00	0.00
Urea fertilizer	1337	0.27	0.54
vet drugs	316	0.00	0.01

Inputs	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
Water	300	0.01	0.02
watermelon seed	200	0.01	0.03
Wheat	28	0.00	0.00
wheat bran	18593	0.64	1.27
Total		50.11	100.00

Source: CITG survey,2022&2023

Damage type

According to Table 129, the total damage to inputs and feed reached US\$50.11 million across 526,442.01 units. Looted items dominated with US\$39.47 million (78.76% share), followed by burned materials at US\$7.72 million (15.41%) and combined & others at US\$2.86 million (5.72%). Broken inputs contributed minimally at US\$0.06 million (0.12%). Implication: The overwhelming scale of looting underscores systematic plunder of agricultural resources, severely undermining food security and future planting cycles while creating massive shortages in essential seeds, fertilizers, and animal feed.

Table 129. Damage to Inputs and Feed by Damage type (US\$ in Millions)

Damage type	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
Broken	726	0.06	0.12
Burned	131985.76	7.72	15.41
Combined & Others	58242.6	2.86	5.72
Looted	335487.65	39.47	78.76
Total		50.11	100.00

Source: CITG survey,2022&2023

Means of Damage

Table 130 shows that looting was the primary means of destruction, accounting for US\$40.00 million (79.82% of total value across 337,106.15 units), followed by other unspecified means at US\$6.95 million (13.87%) and shelling at US\$3.01 million (6.00%). Airstrikes and burning combined with looting were negligible. The predominance of looting as a deliberate mechanism of damage reveals organized expropriation during conflict, transforming agricultural inputs into instruments of economic warfare and prolonging recovery through depleted supplies.

Table 130. Damage to Inputs and Feeds by Means of Damage (US\$ in Millions)

Means of Damage	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
Airstrike	1592	0.08	0.16
Burning and Looting	3766	0.07	0.15
Looting	337106.15	40.00	79.82
Others	114769.76	6.95	13.87
Shelling	69208.1	3.01	6.00
Total		50.11	100.00

Source: CITG survey, 2022&2023

Damage Severity level

As indicated in Table 131, all recorded damage was full, totaling US\$50.11 million (100.00% share across 526,435.01 units), with severe damage registering a negligible US\$0.00 million across just 7 units. The complete destruction or removal of virtually all inputs and feed stocks means that agricultural production cannot resume without massive external replenishment, risking prolonged famine and dependency on humanitarian aid.

Table 131. Damage to Inputs and Feed by Damage Severity Level (US\$ in Millions)

Damage Severity Level	Quantity Damaged	Damage Value(US\$ in millions)	Share (%)
Full Damage	526435.01	50.11	100.00
Severe Damage	7	0.00	0.00
Total		50.11	100.00

Source: CITG survey, 2022&2023

Damage by Perpetrators

Table 132 attributes the largest share to combined forces at US\$43.42 million (86.64% across 370,913.41 units), followed by EDF at US\$2.75 million (5.49%) and AMF at US\$1.24 million (2.47%). ENDF & EDF jointly and ENDF alone contributed US\$0.99 million and US\$0.94 million, respectively.

Table 132. Damage to Inputs and Feed by Damage Perpetrators (US\$ in Million)

Perpetrators	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
AMF	30288	1.24	2.47
Combined Forces	370913.41	43.42	86.64
EDF	58934.1	2.75	5.49
ENDF	31658	0.94	1.87
ENDF & EDF	29250	0.99	1.97
IRF	5398.5	0.78	1.56
Total	526442.01	50.11	100.00

Source: CITG survey, 2022&2023

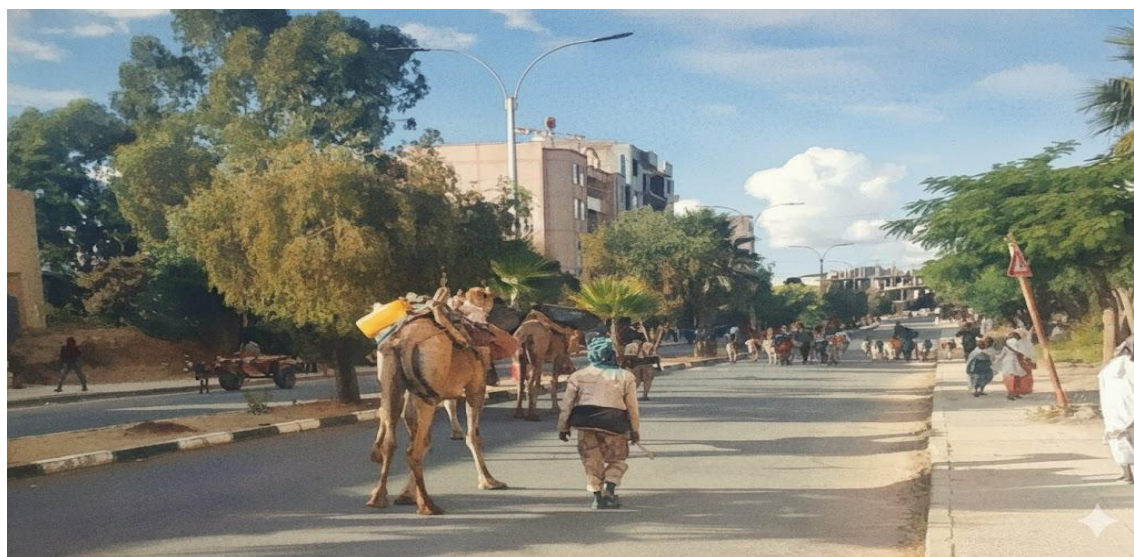


Figure 8: Members the Eritrean Defense forces tracking equines carrying looted assets in Axum, Tigray.
Source: CITG documentation, 2022 and 2023

The dominant role of combined forces in the systematic removal and destruction of inputs signals a coordinated strategy to cripple rural livelihoods, highlighting the weaponization of agriculture and the urgent need for protected supply chains in Tigray region.

Perpetrators, Execution type and Severity of damage of Hazardous materials and wastes

According to Table 133, the total damage to hazardous materials and wastes amounted to US\$0.003 million across 172 units. Agrochemicals (pesticides, herbicides, and fungicides) accounted for the majority at US\$0.0022 million (75.60% share), followed by garbage carts and saj each at US\$0.0004 million (12.48% and 11.92%, respectively). Implication: Despite the small monetary value, the loss of agrochemicals poses significant environmental and health risks due to potential contamination or misuse, requiring immediate containment and safe disposal protocols during recovery.

Table 133. Damage to Hazardous materials and wastes by Damage Value (US\$ in Millions)

Chemicals/hazards	Quantity Damaged	Damage Value(US\$ in millions)	Share (%)
Agrochemicals (pesticides, herbicides and fungicides)	109	0.0022	75.60
Garbage cart	3	0.0004	12.48
Saj	60	0.0004	11.92
Total	172	0.0030	838.67

Source: CITG Survey, 2022&2023

Damage type

Table 134 indicates that combined was the dominant damage type with US\$0.0022 million (75.60% across 109 units), followed by looted items at US\$0.0004 million (12.48%) and burned materials at US\$0.0003 million (11.92%). Implication: The prevalence of combined damage and looting of hazardous substances heightens the threat of uncontrolled release or black-market diversion, endangering both human health and agricultural ecosystems.

Table 134. Damage to Hazardous materials and wastes by Damage type (US\$ in Millions)

Damage Type	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
Burned	60	0.0004	11.92
Combined	109	0.0022	75.60
Looted	3	0.0004	12.48
Grand Total	172	0.0030	100.00

Source: CITG Survey, 2022&2023

Means of damage

As shown in Table 135, other unspecified means caused the bulk of the damage at US\$0.0026 million (87.52% across 169 units), with looting contributing US\$0.0004 million (12.48%). Implication: The reliance on unspecified mechanisms suggests opportunistic or incidental handling during conflict, increasing the likelihood of improper disposal and long-term environmental hazards.

Table 135. Damage to Hazardous materials and wastes by Means of damage (US\$ in millions)

Means of damage	Quantity Damaged	Damage Value (US\$ in millions)	Share (%)
Looting	3	0.0004	12.48
Others	169	0.0026	87.52
Grand Total		0.0030	100.00

Source: CITG Survey, 2022&2023

Damage Severity level

Of The damage severity level, recorded damage was full, totaling US\$0.003 million (100.00% share across 172 units). Implication: Complete loss of containment for hazardous materials demands urgent environmental assessment and remediation to prevent soil, water, or air pollution that could affect surrounding communities and farmland.

Damage by Perpetrators

Table 136 indicates that, the largest share to EDF at US\$0.0026 million (87.52% across 111 units), followed by combined forces/others at US\$0.00036 million (11.92%), with irregular armed forces contributing negligibly. Implication: The primary role of EDF in damaging hazardous materials raises concerns over accountability for potential ecological harm, necessitating international monitoring and specialized cleanup in post-war rehabilitation efforts.

Table 136. Damage to Hazardous materials and wastes by Damage Perpetrators (US\$ in Millions)

Perpetrators	Quantity Damaged	Damage Value(US\$ in millions)	Share (%)
Combined Forces/Others	60	0.0004	11.92
EDF	111	0.0026	87.52
Irregular Armed Forces	1	0.0000	0.56
Grand Total		0.00	100.00

Source: CITG Survey,2022&2023

Loss by category

Table 137 reveals substantial economic losses across the Tigrayan agricultural sector, totaling US\$ 10.9 billion over 2021-2023. Crop and animal production losses owing to disruption of production and access to goods and services accounted for 91% of the total losses.

Majority of the loss comes from crop production losses and animal production losses amounting to US\$8.99 billion and US\$ 1.4 billion, respectively (Table 137). The crop production losses were due to agricultural activity disruptions decreased agricultural inputs supply and technical supports (extension services) and market access challenges.

Table 137. Loss category and monetary values over three consecutive years and by type of ownership (US\$ in millions)

Loss Category	2021 FY (US\$ in Million)	2022 FY (US\$ Million)	2023 FY (US\$ Million)	Public Total (US\$ Million)	Private Total (US\$ Million)	Grand Total (US\$ Million)	Share (%)
I. Disruption of Production (Subtotal 1)	1,945.49	2,775.25	5,686.85	52.17	10,355.34	10,407.51	95.84
Animal production loss	465.58	271.94	666.05	10.05	1,393.53	1,403.57	-
Crop, pulse and vegetable production loss	1,477.85	2,497.07	5,014.47	27.58	4,997.40	8,961.81	-
Animal service (farm power) loss	1.97	6.24	6.33	14.54	0	14.54	-
II. Additional Costs (Subtotal 2)	48.74	42.94	43.44	108.92	26.28	134.4	1.24
Purchase cost	1.44	0.72	0.72	0.2	3.95	2.15	-
Rental	1.89	1.48	1.7	0.05	4.49	5.07	-
Maintenance	2.89	1.15	1.25	0.03	4.12	5.29	-
Other costs	42.51	39.59	39.77	108.65	13.64	121.88	-
III. Foregone Values (Subtotal 3)	115.37	108.13	120.76	107.52	149.55	257.07	2.37
IV. Rehabilitation, Recovery and Reconstruction Expenses (Subtotal 4)	29.06	18.05	13.64	68.04	0	60.53	0.56
Mobilization and Sensitization costs	0.6	0.6	0.6	1.8	-	1.77	-
Training and Psychosocial support costs	0.96	1.1	1.68	3.74	0	3.74	-

Restructuring costs	0.02	0.01	0.01	0.04	0	0.04	-
Technical support costs	0.21	0.23	0.22	0.66	0	0.66	-
Re-establishing database and Archives costs	0.06	0.08	0.1	0.24	0	0.24	-
Emergency veterinary expenses	0.78	0	0	0.78	0	0.78	-
Risk assessment expenses	0.3	0.3	0.3	0.38	-	0.9	-
Training expenses	0.12	0.12	0.12	0.36	-	0.36	-
Shelter construction	0.01333	0.01333	0.01333	0.04	0	0.04	-
Food and Non-food item assistance	26	15.6	10.4	52	0	52	-
Grand Total	2,138.66	2,944.37	5,864.69	336.65	10,531.17	10,859.51	100.00

Source: CITG Survey, 2022&2023

Similarly, animal production and service losses were associated with reduced livestock productivity and services, lack of livestock services (veterinary services, feed supply, reproductive services, market services, etc.). Most importantly, as there was effective Government in place, the lack of Governance and decision-making structure and system contributed to agricultural losses (crop and animal production).

Impact of the war

Compared to the values of the base year (2020), the war, siege and blockade significantly impacted Tigray's livelihood and agricultural assets, resources and systems. UN agencies and other international actors termed the multiple crises as the most catastrophic since World War II, which left the people in a very dire situation. The agriculture sector (public, private and smallholder) was severely damaged and/or looted. All aspects of the agricultural services, input supply and extension support were interrupted and disrupted, and all agricultural leaders, experts and farmers ran away to save their lives and their salaries were interrupted. Hence, agriculture as a system stopped functioning, and a system failure occurred. Moreover, the war forced millions of farmers to be displaced, and their oxen agricultural inputs and farm tools were lost, and they could not produce. Additionally, huge amounts of arable land became unsafe due to the risk of landmines.

As effect of the war, a total direct impact amounting US\$16.77 Billion of damage and loss was reported. Looking at the monetary values of the war effect, the private agricultural firms (micro, small, medium and large enterprises) were most affected (

Figure 9).

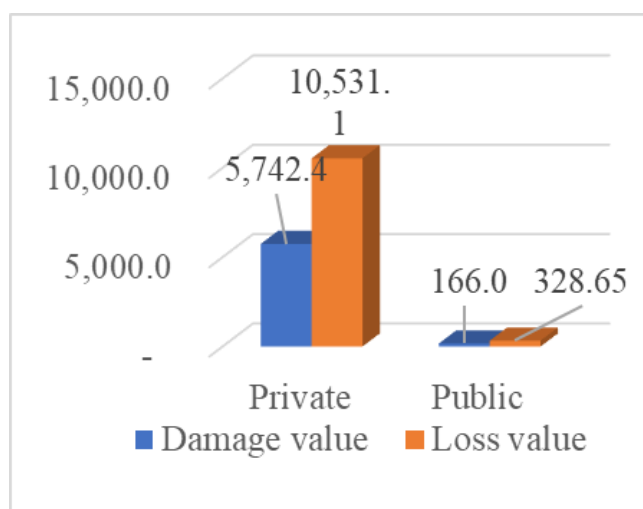


Figure 9 Damage value by ownership (US\$ in Millions)

Private agricultural firms are used to attract both foreign and domestic investments. However, due to the war, siege, and blockade, they lost a total of \$0.182 billion in potential new capital investment opportunities. Many of these firms also exported sesame, fruits, livestock, and animal products to various countries, earning much-needed foreign currency. Unfortunately, the war, siege, and blockade led to a loss of \$0.004 billion in export value of agricultural products.

The war also resulted in significant job losses and rising unemployment rates. Private agricultural firms ceased operations due to damage from the war and the negative impacts of the siege and blockade. As depicted in Figure 45, employment opportunities in these firms plummeted from approximately 49,046 in October 2020 (pre-war) to just 6,791 during the war (from November 2020 to the present). Additionally, about one million temporary jobs were lost in West and Northwest Tigray and approximately 180,000 jobs in other parts of Tigray (Figure 10).

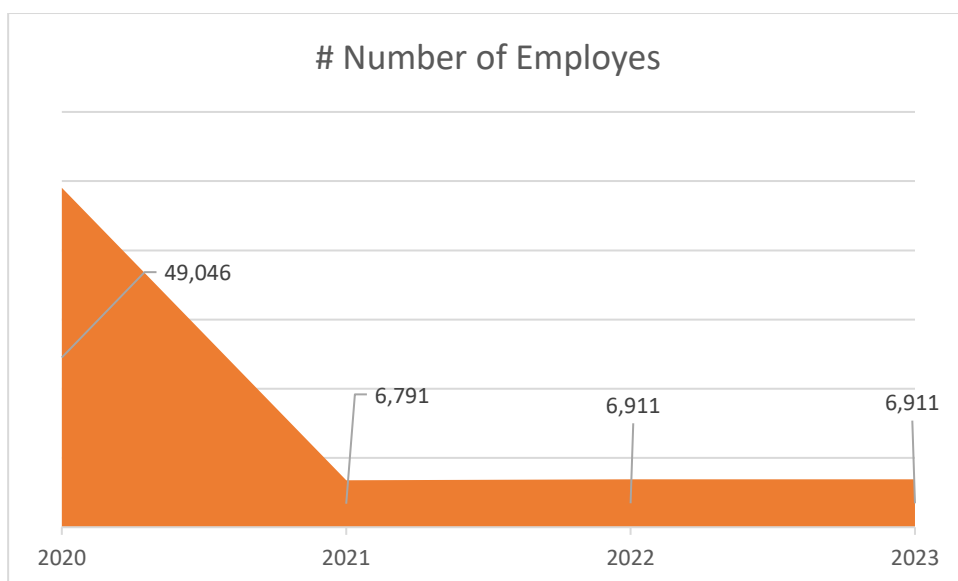


Figure 10: Change in Unemployment Rate over the War-Year versus Base Year (2020).
Source: CITG Survey, 2022 & 2023.

On top of the above indicators of the impact of the war, siege and blockade, the following key implications of the damage and loss of livelihood and Agriculture sector include:

- **Reduced Income and Livelihoods:** Farmers faced significant income losses due to reduced production, increased input costs, and limited market access.
- **Loss of Productive Capacity:** The destruction of livestock, farm equipment, and infrastructure severely impacted the productive capacity of private farms.
- **Increased Vulnerability:** Farmers became more vulnerable to shocks like disease outbreaks and market fluctuations.
- **Disrupted Service Delivery:** Public institutions faced challenges in delivering essential agricultural services, including extension, research, and market support.
- **Weakened Institutional Capacity:** Damage to infrastructure and the loss of human resources significantly weakened the capacity of public institutions to support the sector.
- **Increased Financial Burden:** The war imposed significant financial burdens on the public sector, requiring increased expenditure on humanitarian assistance and emergency response.
- **Reduced Productivity:** Damage to agricultural machinery, farm tools, and livestock has significantly reduced agricultural productivity and farmers' ability to cultivate and harvest crops.

- **Increased Production Costs:** The need to replace damaged equipment and infrastructure will increase production costs for farmers, potentially reducing profitability.
- **Market Disruptions:** Damage to transportation infrastructure and market facilities has disrupted market access for farmers, limiting their ability to sell their produce and access inputs.
- **Reduced Income:** The combination of lower productivity, increased costs, and limited market access has resulted in significant income losses for farmers.
- **Implications for the Private Agriculture Sector:** include the availability of affordable loans, tax incentives, and other financial support mechanisms; improved market access through support for transportation, processing, and marketing infrastructure; ensuring access to quality inputs such as seeds, fertilizers, and veterinary services; and investments in technology and innovation to enhance productivity and competitiveness.
- **Implications for the Public Agriculture Sector:** include reconstructing public infrastructure, strengthening the capacity of agricultural institutions, investing in the training and development of agricultural professionals, and developing and implementing supportive policies such as agricultural insurance schemes and market development programs.

These implications underscore the urgent need for comprehensive recovery and reconstruction efforts to support the recovery of the Tigrayan livelihood and agricultural sector and ensure the long-term food security and economic stability of the region.

2.2.3 Conclusion and Recommendations

Conclusion

The DaLA report comprehensively assessed 89.3% of public Weredas (70 out of 84 agricultural bureaus/offices) and 41.66% of private agricultural firms (encompassing micro, small, medium, and large-scale enterprises). However, assessments were limited in the Western Zone of Tigray and select pocket areas in the Northwest, Central, and Eastern Zones due to prevailing security constraints.

The war, siege, and blockade inflicted a staggering US\$16.32 billion in total economic impact on Tigray's agriculture sector, comprising US\$5.46 billion in direct damages and US\$10.86 billion in losses. Multiple perpetrators were involved, including the Ethiopian National Defense Force (ENDF), Eritrean Defense Forces (EDF), Ethiopian Federal Police, Amhara Regional Forces, Afar Regional Forces, Somali troops, and irregular armed groups. Notably, the ENDF, EDF, and Amhara Regional Forces bore primary responsibility for the majority of the destruction.



Damaged Private Agriculture Infrastructure and Assets¹¹
Source: TIC, 2022 and 2023.

These losses stemmed predominantly from the complete siege and blockade, compounded by the war's direct effects, which decimated the sector's production and productivity capacity. The conflict ravaged every corner of Tigray, impacting all farming communities (public and

¹¹ **Error! Reference source not found.**4 shows ,

C1: Damaged Animal Feed Factory and its equipment and feed products in Raya Azebo, Southern Zone of Tigray.

C2: Commercial Agriculture Firm in Raya Azebo with damaged consumable products in store and

C3: different durable assets in warehouses.

private), every sub-sector of the agricultural economy, and critical infrastructure and assets. This provides compelling evidence of indiscriminate and intentional acts by invading forces, deliberately aimed at undermining the conditions of life for Tigrayan communities. The resultant collapse of the agricultural system has rendered millions food insecure, jobless, and without income, profoundly eroding the livelihoods, resource bases, and capabilities of the Tigrayan people.

This report establishes a robust foundation for Recovery, Reconstruction, and Resilience (RRR) initiatives under a Build Back Better (BBB) framework, while serving as irrefutable evidence for accountability and compensation mechanisms.

Recommendations

The following recommendations are necessary for a comprehensive, multi-phase recovery strategy focused on restoring the structural integrity and operational capacity of Tigray's agricultural sector.

A. Immediate Action: Restoring Basic Capacity and Security

- **Establish a Private Sector Emergency Credit & Grant Fund:** Immediately deploy a recovery fund with flexible terms, tailored specifically for the micro-enterprises and sole proprietors that bore 91% of the physical loss. This fund must prioritize the replacement of high-value productive assets like farm machinery (Tractors) and essential infrastructure components (Electrical Assets).
- **Prioritize Institutional Repair for Service Delivery:** Concentrate reconstruction funds on the most critical public infrastructure: Veterinary Clinics and Artificial Insemination (AI) Centers, and FTCs in the hardest-hit zones (South and Western). This must be coupled with an emergency drive to replace Office Equipment and Materials to rapidly restore the decentralized extension system.
- **Enhance Site Security:** Implement urgent security protocols and community-based asset protection schemes for all remaining and newly rebuilt warehouses, farm facilities, and veterinary/AI centers to prevent further Looting, which the data identifies as a major source of financial loss.

B. Medium-Term Strategy: Rebuilding the Value Chain

- **Re-Capitalize the Animal Sector:** Given the importance of animal resources (contributing 34–48% of agricultural GDP), a dedicated program is needed to restore the Begait, Raya, and Abergelle indigenous breeds through subsidized breeding programs and re-equipping the AI Centers.
- **Reconstitute Research and Extension:** Fully fund the reconstruction and re-staffing of the Tigray Agricultural Research Institute (TARI) centers, including replacing destroyed Lab Assets. Research must pivot to focus explicitly on climate-resilient, short-cycle, high-value crops to quickly boost food security and market income.
- **Revive Cooperative and Financial Linkages:** Provide urgent technical and financial assistance to the Tigray Cooperative and Market Promotion Agency (TCMPA) to help re-establish primary cooperatives, which are essential for input supply, collective marketing, and accessing credit to overcome market fragmentation.

C. Long-Term Policy: Building Resilience

- **Integrate Disaster Risk Financing:** Develop and implement risk management instruments, such as credit-backed agricultural insurance, tailored to smallholders to manage systemic risks (drought, war) and reduce future reliance on emergency humanitarian aid.
- **Focus on High-Value Irrigated Agriculture:** Leverage the remaining or repairable micro-dams and water harvesting structures to shift greater land area into high-value irrigated horticulture and seed production, reducing reliance on erratic rainfall and boosting income reliability.
- **Invest in Digital and Data Infrastructure:** Provide dedicated funding for ICT Assets and Infrastructure to rebuild a resilient, digitized agricultural data system, allowing for better resource tracking, early warning systems, and efficient deployment of extension services across a decentralized network.

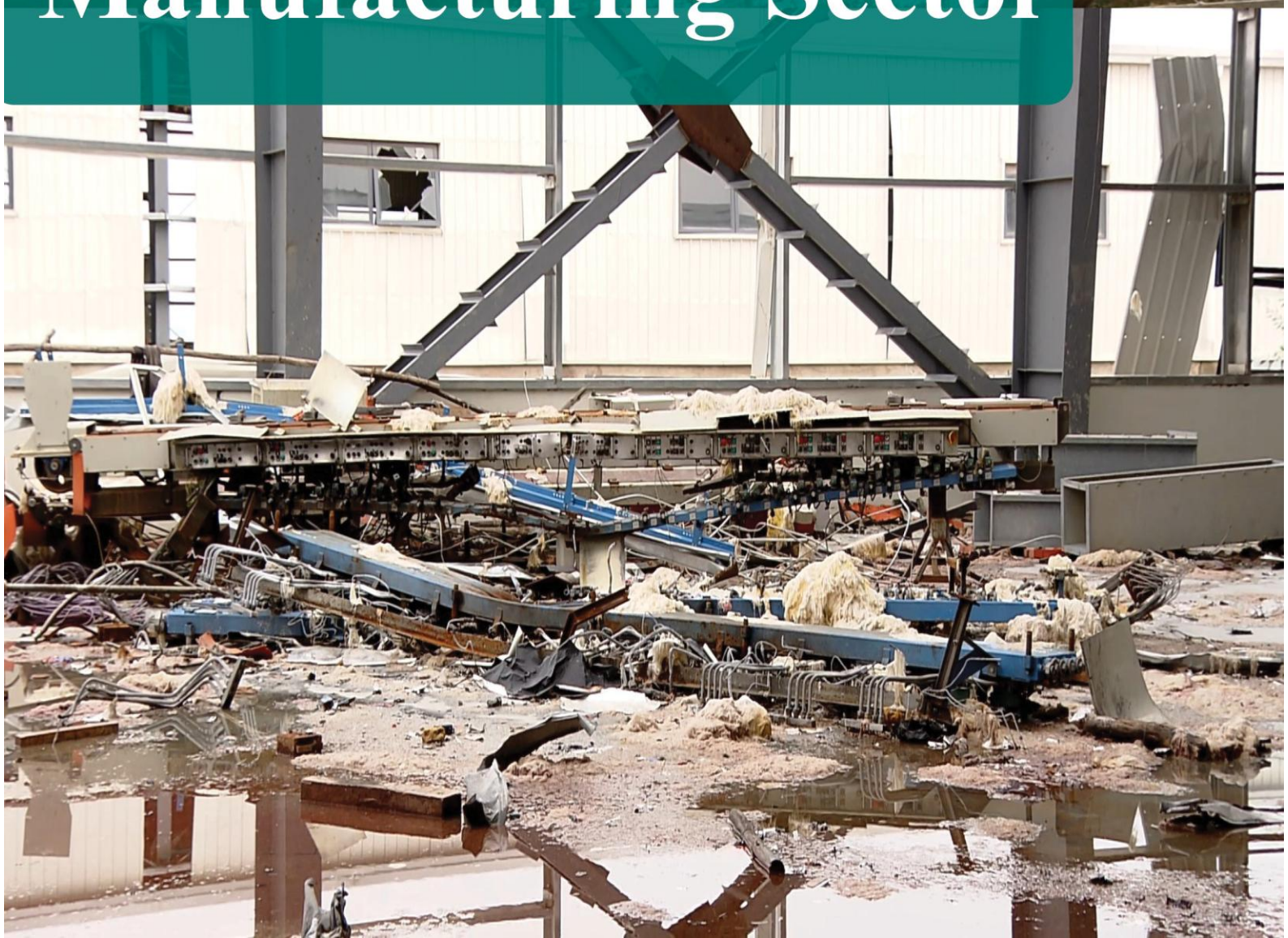
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Manufacturing Sector



2.3 Damage and Loss to Manufacturing Industry

2.3.1 Introduction (Pre-war Context)

The manufacturing sector in Tigray, prior to the November 2020 war, was a vital and growing economic driver characterized by significant investment, high employment, and strong integration with the regional and national economy.

Structure and Size:

The sector was highly diversified, encompassing sub-sectors like Furniture & Metal, Agro-processing, Textile & Cottage, Construction Materials, Chemicals, and Mining. The vast majority (90%) of manufacturing enterprises were Micro and Small Enterprises (MSEs), although the few large-scale firms made substantial economic contributions.

Economic Performance & Contribution:

Tigray's industry sector was a vital economic driver, attracting a significant share of Ethiopia's total domestic investment (28.49% of the industry sector's share) and US\$43.7 million in Foreign Direct Investment (FDI) in 2019, while domestic investment from other regions totalled US\$169 million in 2019/2020. The sector served as a major job creator, providing employment for approximately 148,144 individuals across various modalities before the war. It played a critical role in earning hard currency, generating over US\$7.18 million from product exports and an additional \$16.88 million from foreign currency transactions in 2019. Furthermore, it was a key tax contributor, paying approximately US\$19.8 million to the federal government and about US\$283 million to the regional government in 2019.

Strategic Role:

Manufacturing acted as a nucleus for regional development, integrating upstream sectors (agriculture, labor market) and driving downstream growth in services and urbanization. It was crucial for import substitution (e.g., in metallurgy and pharmaceuticals) and enhancing Ethiopia's international competitiveness.

2.3.2 Results

Institutional Profile of Assessed Firms

Geographic Distribution and Pre-War Functionality

The assessment covered 8,361 private firms across seven zones. The largest share of data was collected from Eastern (30%), followed by Mekelle (19.8%) and Central (18.4%) zones (Figure 11(a)). This distribution reflects accessibility during data collection—not the zonal intensity (proportion) of damage. Pre-war functionality data also indicate that 74.5% of firms were fully functioning, demonstrating that the majority of enterprises had successfully reached operational maturity (Figure 11(b)). This high level of functionality reflects robust industrial performance, demonstrating that industries in Tigray were effectively utilizing investment, infrastructure, and workforce capacity in the pre-war period. The remaining 26.5% of firms were either under construction, on trial, or in the early stages of setup, indicating a sector in expansion and transition at the time of disruption (Figure 11(b)). In addition to private firms, the assessment included two public institutions based in Mekelle involved in governance and service provision for the manufacturing sector. This brings the total number of assessed institutions to 8,363, ensuring that both productive and regulatory dimensions of the sector are represented in the analysis.

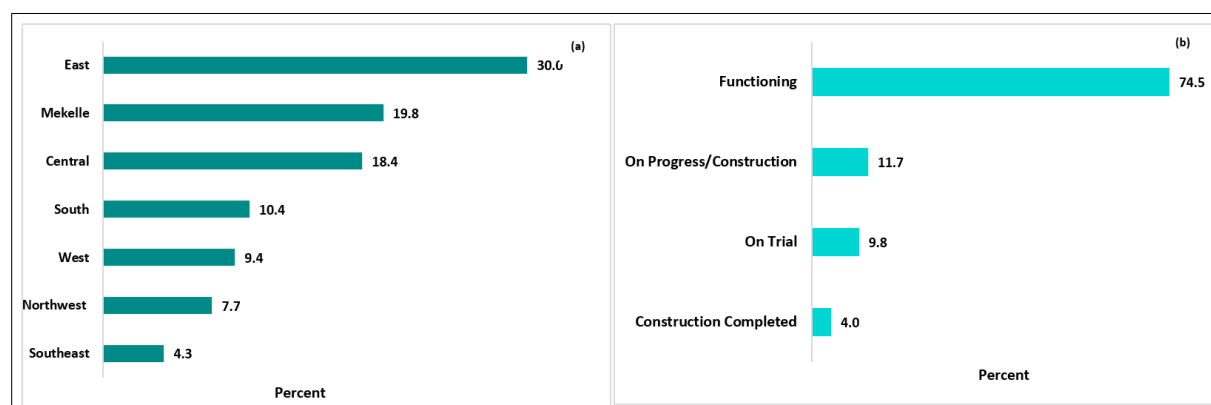


Figure 11. Zonal Distribution (a) and Pre-War Functionality (b) Status of Assessed Firms

This figure shows the number of firms assessed per zone and their operational status before the war (2020). The distribution reflects accessibility during data collection—not the zonal intensity (proportion) of damage across zones.

Source: Survey, 2022

Establishment, Firm Size, and Capital Source

The manufacturing sub-sector is mainly composed of sole proprietorships (81.2%), followed by share companies (9%) and partnerships (7.8%) (Figure 12(a)), which may limit firms' access to formal recovery mechanisms such as insurance claims, credit guarantees, and institutional grants—particularly in post-conflict settings where documentation and legal status

are prerequisites for support. Firm size data revealed that 70.4% of firms were micro enterprises, with only 2.4% classified as large (Figure 12(b)). This size distribution underscores the sector’s fragility, low capital intensity, and limited absorptive capacity for reconstruction financing, asset replacement, and supply chain reactivation. The dominance of micro firms also suggests a need for tailored recovery instruments that accommodate informal operations and limited collateral.

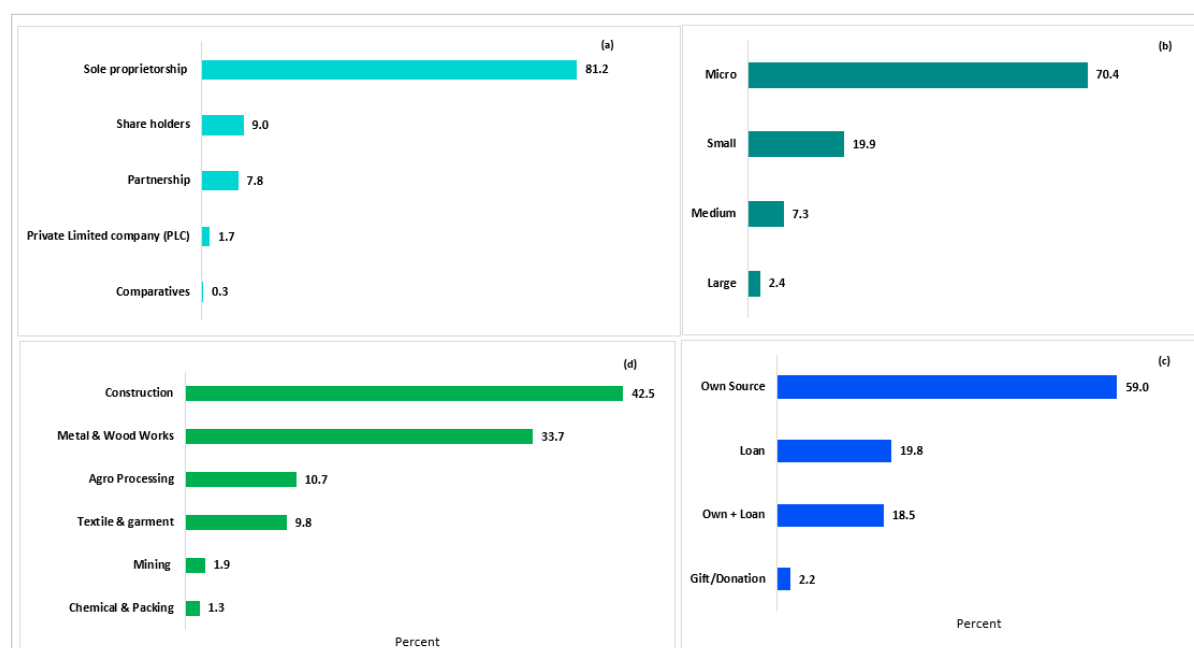


Figure 12. Distribution of Firms by Establishment (a), Firm Size (b), Subsector (c), and (d) Capital Source.

Source: Survey, 2022

Subsector distribution data ((Figure 12(c)) also showed that the majority of assessed firms operate in Construction (42.5%) and Metal & Wood Works (33.7%), followed by Agro-processing (10.7%) and Textile & Garment (9.8%). This concentration in construction and metalwork presents a strategic opportunity for infrastructure-led recovery, as these subsectors are directly linked to rebuilding efforts. However, it also exposes them to high material and labor dependency risks, which may delay recovery if supply chains remain disrupted or skilled labor is displaced.

Regarding startup financing, 38.3% of firms relied on loans or mixed financing (loan plus own capital), while 59% used their own capital. Only 2.2% obtained support through donations or grants. (Figure 12(d)). This financing profile highlights the prevalence of debt- or self-financed entrepreneurship, which may amplify financial vulnerability in the aftermath of conflict—particularly in a context where the war has weakened financial institutions and eroded private capital. These conditions complicate access to concessional recovery instruments, especially for firms without formal credit histories or collateral.

Taken together, the institutional and operational profile of assessed manufacturing firms reveals a sector marked by informality, financial precarity, and strategic concentration—factors that must be addressed through tailored recovery instruments and phased reconstruction planning.

Damage to Manufacturing by item

The assessment report highlights an unprecedented level of destruction in Tigray’s manufacturing sector, impacting both fixed infrastructure and movable assets. Damage involves over 128,000 item types, with an estimated total damage value of US\$3.51 billion. These findings illustrate the severe disruption to production, operational continuity, and supply chains integrity (Table 138).

Table 138. Estimated Damage to Manufacturing Infrastructure and Assets by Item Type.

Item	Number of types damaged	Quantity damaged	Value of Damage (million USD)	Share (%)
Building	4,318	4,911,496	54.52	1.6
Vehicles	3,140	3,687	201.95	5.8
Inventory	65,565	69,740,387	349.22	10.0
Office furniture and equipment	9,731	951,407	95.50	2.7
Electrical materials	4,340	881,733	35.24	1.0
ICT items	3,729	392,307	63.83	1.8
Properties on Transit	360	3,129,491	241.35	6.9
Machine and Machinery	13,509	4,494,664	1,222.69	34.9
Consumable items	21,488	801,917,290	288.88	8.2
Chemicals and by-products	2,029	14,205,008	954.42	27.2
Total	128,209		3,507.60	

The “Building” category encompasses associated infrastructure, including road networks and water treatment lines.

Source: Survey data, 2022 and 2023.

At the core of this devastation lies the destruction of capital-intensive resources. Machines and machinery account for 34.9% of the total damage value. These assets are crucial for manufacturing throughput and capacity utilization, and losing them directly hampers the sector’s ability to restart production. The significant financial impact underscores the specialized, capital-intensive nature of industrial equipment, which often requires long lead times and substantial investment to replace. Chemicals and by-products are following in financial impact in this category, valued at US\$954.42 million. While the number of damaged units is quite low, the high replacement costs highlight their essential role in manufacturing. Losing these inputs not only stops production but also risks violating safety and quality standards, especially in industries that depend on regulated or hazardous materials.

The attack on the chemical manufacturing sector caused severe damage beyond mere looting and burning. The invaders not only destroyed chemical and by-product stocks but also dumped them directly onto the soil, exacerbating the impact. This deliberate contamination highlights that the consequences extend far beyond physical asset destruction and the disruption of human resources. The release of toxic chemicals into the environment poses serious risks to soil and water quality, with potential long-term effects on public health, agriculture, and surrounding ecosystems. The following figure 9 illustrates the extent of this environmental contamination, showing how hazardous substances from the manufacturing sector have infiltrated the natural environment. Such actions reflect a multidimensional impact: while factories and inventories have been physically devastated, the ecological consequences are equally significant. This situation underscores the urgent need for environmental assessment and remediation alongside rebuilding physical infrastructure. Addressing the contamination is critical not only to restore production capacity but also to safeguard the health of communities and the sustainability of local ecosystems. Overall, the attack demonstrates that industrial damage in conflict zones can trigger cascading effects.



Chemical Contamination at Sheba Leather Factory, Wukro (Nov 20, 2020) Two large chemical storage units were deliberately destroyed, and hazardous substances were dumped into the soil—reportedly to retrieve the empty containers. Attributed to: EDF Source: CITG Surveys (2002, 2023).

The war has also highly damaged the operational and input capacity of the firms. Inventory damages further compound the sub-sector's vulnerability. With nearly 69.74 million units affected, valued at US\$349.22 million, these damages disrupt both raw material availability and finished goods delivery. The implications extend beyond production cuts, affecting contractual obligations, market linkages, and revenue generation—especially for firms

engaged in time-sensitive, internationally competitive, or export-oriented operations. Similarly, damage on consumable items, though vast in quantity—over 801.9 million units—have a moderate financial impact of US\$288.88 million, reflecting their low unit value but high-volume usage across production lines.



Destruction of Civilian Manufacturing Inventories – Sheba Leather Factory, Wukro (Nov 2020) The damaged inventories consisted solely of civilian-use products with no military relevance. The destruction targeted public objective assets, undermining local livelihoods and industrial capacity. Attributed to: EDF Source: CITG Surveys (2022, 2023).

The destruction of vehicles and properties in transit, valued at US\$201.95 million and US\$241.35 million respectively, indicates serious disruptions in logistics and support systems. These assets are crucial for transporting inputs and outputs throughout the supply chain; their loss increases operational costs and hampers delivery efficiency. Without restoring transport capacity, even firms with functional production facilities may find it difficult to resume operations. Additional damages to logistics and support systems include office furniture and equipment (US\$95.5 million), ICT equipment (US\$63.83 million), and electrical materials (US\$35.24 million). Though less costly, these losses significantly disrupt administrative and coordination functions, which are essential for management, monitoring, and automation—key components of modern manufacturing environments.

Structural infrastructure, including buildings, roads, and water treatment lines, accounts for US\$54.52 million in damage. While the number of affected units is modest, the capital intensity and foundational role of these assets make their rehabilitation essential for operational continuity.

In conclusion, the distribution of damage reveals a sector facing multi-dimensional challenges. Financial losses are concentrated in production-critical assets such as machinery, chemicals, and inventory, while infrastructure, logistics, and support systems also require urgent attention. These findings suggest that recovery efforts must be strategically phased, beginning with the

restoration of core production capacity, followed by the replenishment of high-value inputs and the rehabilitation of logistical and operational support systems. Without targeted interventions that prioritize asset replacement, liquidity restoration, and infrastructure repair, the manufacturing sector’s ability to resume full-scale operations and contribute meaningfully to regional economic recovery will remain severely constrained.

Damage to Manufacturing by Type

Disaggregated damage data shows that burning and looting are the overwhelmingly dominant forms of destruction in Tigray’s manufacturing sector. Out of an estimated US\$3.51 billion in total damage, burning accounts for US\$2.21 billion (63.1%), while looting makes up US\$805.48 million (23%) (Table 2). These two causes together represent more than 86% of the total damage, suggesting a pattern of targeted and systematic attacks on productive assets. Other damages include broken items (11.2%), structural destruction (1.9%), and theft (0.8%), which, while smaller, still highlight vulnerabilities in operations and security. Damage from bullets and missed items, though minor in monetary terms, provides insights into war exposure and asset traceability challenges (Table 139). This analysis examines item-level data to emphasize the financial consequences and operational effects of each destruction mechanism, revealing clear patterns in how various manufacturing assets were affected.

Table 139. Estimated Damage to Manufacturing Infrastructure and Assets by Damage Type (Value in Million USD).

Item	Damage type							Total
	Broken	Bullet	Burning	Destruction	Looted	Missed	Theft	
Building	0.3	-	37.7	16.5	0.002	-	0.0045	54.5
Chemicals and by-products	312.4	-	616.5	3.5	22.0	-	-	954.4
Consumables	0.004	-	11.4	-	257.4	20.1	-	288.9
Electrical materials	-	-	33.9	1.3	-	-	-	35.2
ICT items	1.5	-	61.0	1.3	-	0.01	-	63.8
Inventory	0.1	-	62.6	-	281.1	5.4	-	349.2
Machine and Machinery	0.1	-	1,184.3	38.0	-	0.4	-	1,222.7
Office furniture and equipment	0.4	-	17.1	-	74.5	3.5	-	95.5
Properties on Transit	71.1	0.01	-	-	170.3	-	-	241.4
Vehicles	5.9	-	188.1	7.7	0.2	-	-	201.9
Total	391.7	0.01	2,212.6	68.4	805.5	29.4	0.0045	3,507.6
Share	11.2	0.0002	63.1	1.9	23.0	0.8	0.0001	100.0

The “Building” category encompasses associated infrastructure, including road networks and water treatment lines.

Source: Survey data, 2022 and 2023.

With regard to buildings and associated infrastructure, the overwhelming majority of the total damage stems from burning (US\$37.73 million) and destruction (US\$16.51 million), together

accounting for over 99% of the total. These figures reflect the deliberate targeting of structural assets, with fire and forceful dismantling causing irreversible damage to operational facilities.

Similarly, these two types of damage were the most common, accounting for nearly 97% of all vehicle damage, with US\$188.08 million (93%) caused solely by burning. The high incidence of fire-related destruction highlights a widespread focus on transport assets, significantly disrupting mobility, supply chains, and distribution networks (Table 139). The war not only severely impacted vehicles but also affected items within transport systems. Goods in transit were mainly impacted by looting (US\$70.27 million, 70.5%) and breakage (US\$71.08 million), which together make up almost 100% of the damage. These figures reveal the increased vulnerability of mobile assets during the war, with consequences for trade and supply chain resilience. Support systems were also mainly affected by either looting or burning. For office furniture and equipment, looting (US\$74.51 million, 78%) and burning (US\$17.14 million) were the primary causes, accounting for about 96%, underscoring the susceptibility of administrative assets to opportunistic theft and fire, both of which hinder coordination and record-keeping essential for recovery. The high dominance of burning, accounting for nearly 96% in both ICT items (US\$61.01 million) and electrical materials (US\$33.91 million), indicates that fire incidents have almost entirely destroyed digital infrastructure and power systems. This has significantly impacted data systems, automation, and communication, which are essential for recovery operations.

In Inventory, looting (US\$281.09 million, 80.5%) and burning (US\$62.57 million) are the main causes, together accounting for 98.4%. These losses directly impact production continuity and market supply, especially for firms with limited buffer stock or export commitments. Consumable goods, with losses of US\$257.41 million (89.4%) due to looting, were particularly affected, reflecting their high volume and ease of movement, which made them prime targets during the war. Burning added US\$11.39 million in damages, demonstrating that even low-value items were not spared from deliberate destruction, bringing the total damage to over 93% in collaboration with looting.

Machines and machinery, the most financially significant category, experienced damage primarily from burning, which caused US\$1.18 billion (96.9%) in damage and from destruction which caused US\$38 million (3%) in damage, together accounting for about 99.96% of the total damage. This scale and cost emphasize the devastating impact on manufacturing capacity and the pressing need for capital replacement. In contrast, the majority of damage to chemicals

and by-products results from burning (US\$616.52 million, 64.6%), with breakage following at US\$312.42 million, accounting for 97.3% of the total damage. These data highlight the high costs and vital role of chemical inputs in manufacturing, where fire and physical damage can lead to total stock loss and contamination risks.

These patterns suggest deliberate targeting of productive and movable assets, with fire used to eliminate operational capacity and looting to extract economic value. Recovery planning must therefore prioritize replacement of burned machinery and chemicals, replenishment of looted inventories and consumables, and restoration of transport and ICT systems, with tailored interventions for each asset class based on financial severity and operational criticality.

Damage to Manufacturing Means of Damage

Breaking down the damage caused by means of damage (Table 140) reveals a complex mix of war-related and opportunistic mechanisms that have severely impacted Tigray's manufacturing sector. Out of an estimated total damage of US\$3.51 billion, looting stands out as the most financially damaging, making up US\$2.26 billion (64.5%). This figure indicates extensive and systematic removal of assets, especially high-value, portable items like machinery, chemicals, inventory, ICT, and consumables (Table 140). The extensive looting highlights a deliberate effort to cause economic harm to the region and benefit the perpetrators during periods of war.

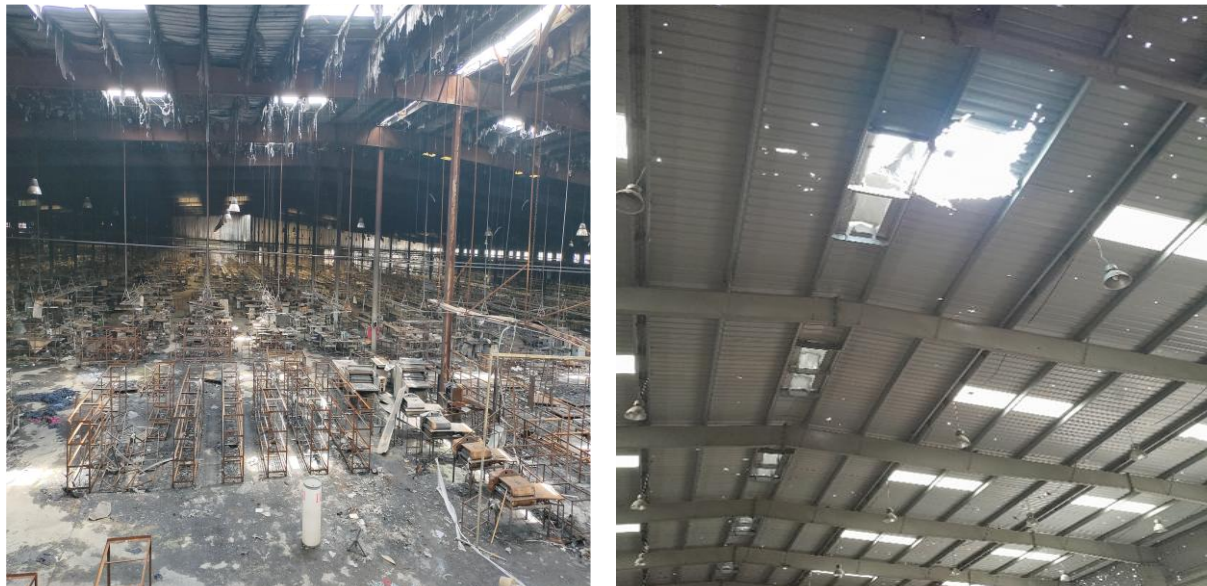
Table 140. Estimated Damage to Manufacturing Infrastructure and Assets by Means of Damage (Value in Million USD).

Item	Means of Damage								Total
	Air striking	Bullet attack	Burning	Heavy artillery	Looting	Robbery	Combination	Other	
Building	9.82	3.61	11.58	16.32	13.19				54.52
Chemicals and by-products	0.48	2.15	12.20	258.33	672.08	9.17	0.001		954.42
Consumables	12.36	18.54	21.78	17.85	94.62		123.73		288.88
Electrical materials	1.84	25.79	6.72	0.87	0.01				35.24
ICT items	0.11		0.12	0.20	63.40			0.004	63.83
Inventory	0.79	0.46	1.73	69.07	226.45	5.84	44.88		349.22
Machine and Machinery	12.53	0.62	6.45	30.65	1,127.16	45.16	0.12		1,222.69
Office furniture and equipment	1.20	7.76	17.92	2.51	62.55	0.63	2.13	0.80	95.50
Properties on Transit			0.01	240.35	1.00				241.35
Vehicles	122.81	21.69	36.68	17.44	3.03	0.30			201.95
Total	161.94	80.64	115.19	653.59	2,263.48	61.11	170.86	0.80	3,507.60
Share	4.6	2.3	3.3	18.6	64.5	1.7	4.9	0.0	

The "Building" category encompasses associated infrastructure, including road networks and water treatment lines.

Source: Survey data, 2022 and 2023.

Heavy artillery is the second most destructive mechanism, responsible for US\$653.59 million (18.6%) in damage. This form of destruction inflicted extensive losses on buildings, inventory, chemicals, and goods in transit, often resulting in large-scale structural collapse and the obliteration of stored materials (Table 140). The high financial toll of artillery damage, despite fewer incidents compared to looting, points to the concentrated and high-intensity nature of these attacks.



Structural Damage to Civilian Industrial Facilities – Tigray (2020)

(Left panel) Alemeda Textile Factory, Adwa – Internal structural damage inflicted from the ground floor.

(Right Panel) Semayata Stone Dimension, Wukro – Roof collapse caused by long-range bombing. Both sites were civilian manufacturing facilities targeted by EDF. Source: CITG Surveys (2022, 2023)

The devastating impact of burning resulted in an astonishing US\$115.19 million in damages, constituting 3.3% of the total losses incurred. This destructive phenomenon affected nearly all categories of assets, revealing its pervasive threat. Although the financial toll from burning is less than that of looting or artillery, its consequences are particularly severe for vehicles, office equipment, and consumables. The data indicates that fire was employed not only as a direct weapon but also as a collateral consequence of broader military operations; in many cases, incidents of burning were strategically combined with looting to amplify the scale of destruction.



Destruction of Heavy Machinery – Semayata Dimension Stone Factory, Wukro (Nov 2020) EDF forces reportedly destroyed key industrial equipment, severely impairing the factory's operational capacity and local economic activity. Source: CITG Surveys (2022, 2023)

Air strikes, though less frequent, inflicted a substantial US\$161.94 million in damage, representing 4.6% of total losses. These precision military strikes primarily targeted critical assets such as vehicles, buildings, and machinery, leading to significant operational disruptions. The aftermath was particularly pronounced in crucial transportation and production infrastructures, crippling the ability to function effectively.

In contrast, bullet attacks accounted for US\$80.64 million in damages, comprising 2.3% of the overall monetary losses. Despite their relatively smaller scale, these attacks had a disproportionately severe impact on electrical and electronic equipment, where even isolated incidents could yield catastrophic losses (Table 140). This pattern suggests an intentional strategy aimed at inflicting targeted damage on sensitive or high-value components, likely located in control rooms or power systems, thereby amplifying the overall disruption caused by the war.

Robbery, separate from organized looting, caused losses of US\$61.11 million (1.7%), mainly affecting machinery, chemicals (and by-products), and inventory (Table 140). This type of theft often involves individuals or small groups exploiting opportunities, frequently after larger attacks. Other minor damage sources, amounting to US\$0.80 million, include unclassified or indirect damages mainly related to office equipment and ICT assets. Damage involving multiple destructive methods, valued at US\$170.86 million (4.9%), encompasses incidents with combinations like looting followed by burning or artillery strikes. These complex damage

cases, especially impacting inventory and consumables, hinder recovery and valuation, as overlapping destruction types increase both material loss and financial impact burden.

Across all categories, the data reveals that looting and heavy artillery are the principal drivers of financial loss, together accounting for over 83% of total damage. These mechanisms reflect both opportunistic asset extraction and deliberate targeting of industrial infrastructure.

Damage to Manufacturing Severity

The disaggregation of damage by severity offers critical insight into the scale of destruction and the urgency of recovery needs across Tigray’s manufacturing sector. Of the total USD 3.51 billion in estimated damage, an overwhelming US\$2.99 billion (85.1%) is classified as complete destruction, indicating total loss of assets with no potential for repair or salvage (Table 141). This concentration of high-severity damage underscores the catastrophic nature of the war and the immense capital required to restore production capacity.

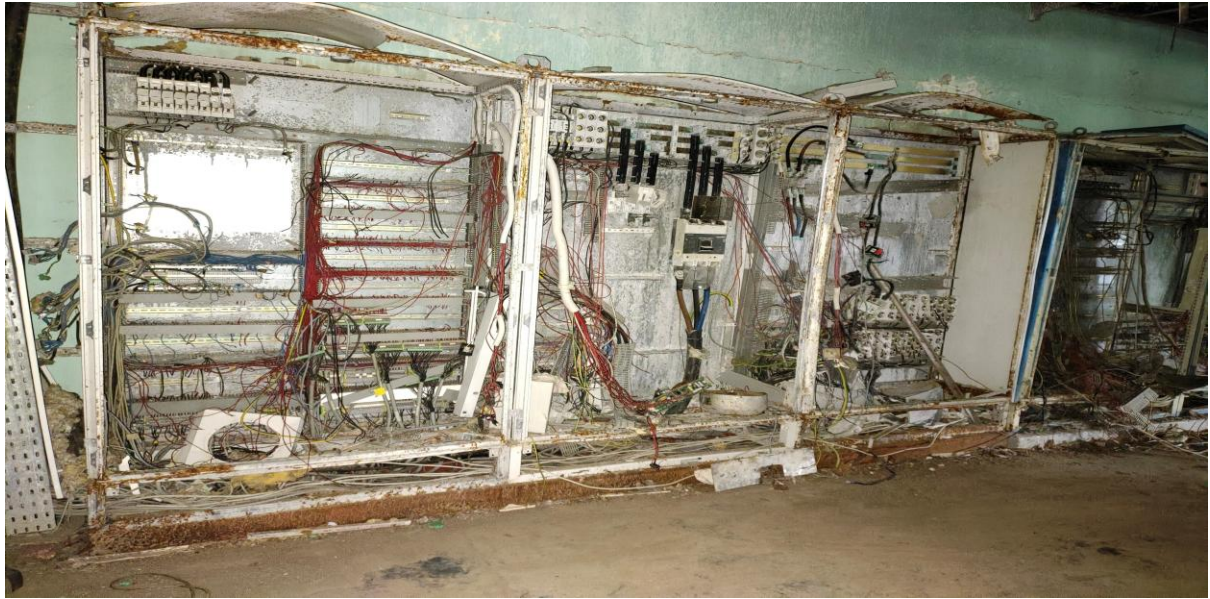
Table 141. Estimated Damage to Manufacturing Infrastructure and Assets by Severity of Damage (Value in Million USD).

Item	Severity of Damage				Total
	Low	Moderate	High	Complete	
Building	11.55	24.81	0.79	17.37	54.52
Chemicals and by-products	2.63	0.85	0.95	949.99	954.42
Consumable items	10.86	29.01	0.06	248.95	288.88
Electrical materials	0.08	27.30	0.00	7.85	35.24
ICT items	0.01	-	-	63.82	63.83
Inventory	5.45	48.66	0.02	295.10	349.22
Machine and Machinery	2.01	9.71	0.03	1,210.95	1,222.69
Office furniture and equipment	16.72	74.18	1.37	3.23	95.50
Properties on Transit	34.86	0.28	24.71	181.50	241.35
Vehicles	4.12	185.94	5.57	6.31	201.95
Total	88.29	400.73	33.50	2,985.08	3,507.60
Share	2.5	11.4	1.0	85.1	

The “Building” category encompasses associated infrastructure, including road networks and water treatment lines.

Source: Survey data, 2022 and 2023.

The most financially devastating complete losses are concentrated in machines and machinery (US\$1.21 billion), chemicals and by-products (US\$949.99 million), and inventory (US\$295.10 million). These categories alone account for over 82.3% of all the complete damage, reflecting the deliberate targeting or extreme vulnerability of production-critical assets. In the case of ICT, virtually all losses (US\$63.82 million) are attributed to complete destruction, underscoring the vulnerability of digital infrastructure to fire, looting, and physical damage.



ICT Infrastructure Damage – Sheba Leather Factory, Wukro (Nov 2020) EDF forces reportedly targeted and damaged critical ICT systems within the manufacturing facility, disrupting operations and data management capacity. Source: CITG Surveys (2022, 2023)

Moderate damage, representing 11.4% of total damage, is most common in vehicles (US\$185.94 million, 92%) and office furniture and equipment (US\$74.18 million, 77.7%). Most of these assets are not fully destroyed but need significant repairs or partial replacements. Focusing on their recovery early on is more cost-effective and essential for restoring basic operations and administrative functions.



Vehicle Damage Severity – Sheba Leather Factory, Wukro (Nov 2020) EDF forces reportedly inflicted severe damage on transport and logistics vehicles belonging to Tigray's manufacturing sector, undermining mobility, supply chains, and post-conflict recovery efforts. Source: CITG Surveys (2022, 2023)

High-severity damage, though only US\$33.50 million (1% in total damage), is significant in properties in transit (US\$24.71 million) and vehicles (US\$5.57 million). These assets often hover between repairable and total loss, requiring careful technical evaluation to decide whether restoration is cost-effective. Low-severity damage, totaling US\$88.29 million (2.5%), is primarily found in properties in transit (US\$34.86 million), office furniture (US\$16.72 million), buildings (US\$11.55 million), and consumables (US\$10.86 million). While less severe, these damages still have substantial financial impacts due to the number of affected units and the cumulative cost of minor repairs. Addressing these early can lead to quick operational improvements, especially for small and medium-sized entities enterprises.

The severity profile across different asset types exhibits a strongly bimodal distribution: some categories, like buildings and vehicles, display a combination of moderate and complete damage, whereas others—like ICT, chemicals, and inventory—are predominantly destroyed. This indicates that while some assets might be repairable, most require full replacement.

From a recovery planning perspective, this analysis supports a phased and severity-informed approach: (1) Immediate restoration of low-severity and moderate-damage assets, especially in logistics, office infrastructure, and vehicles, to reestablish basic operations and coordination, (2) Strategic repair or partial replacement of moderately damaged production inputs, including inventory and consumables, to resume limited production, and (3) Capital mobilization for full replacement of completely destroyed machinery, chemicals, and ICT systems, which are essential for restoring full-scale manufacturing capacity. This sequencing ensures that limited resources are deployed efficiently, balancing short-term functionality with long-term sectoral recovery. The severity-based lens also enables targeted support to firms based on the depth of their losses, ensuring that recovery interventions are both equitable and impact-driven.

Damage to Manufacturing Perpetrators

The disaggregation of damage by perpetrator type reveals a complex and multi-actor landscape of destruction across Tigray's manufacturing sector. Of the total US\$3.51 billion in estimated damage, the largest share—US\$1.67 billion (47.6%)—is attributed to the Eritrean Defense Forces (EDF) acting independently. This figure reflects widespread and systematic destruction, particularly of machines and machinery (US\$1.16 billion), chemicals and by-products (US\$267.53 million), and consumables (US\$104.19 million) (Table 142). The scale and concentration of damage suggest deliberate targeting of high-value production assets.

Table 142. Estimated Damage to Manufacturing Infrastructure and Assets by Perpetrator (Value in Million USD).

Item	Separate Perpetration						Collaborated Perpetration					
	AMH	EDF	ENDF	AFR	EFP	ORM	Illegal armed	Others	ENDF & EDF	EDF & EFP	ENDF & EFP	Other combinations
Building, including road and water treatment lines	3.14	0.63	0.42	8.48	14.21							27.65
Vehicles	4.65	62.09	117.88		16.24		0.38		0.71			0.01
Inventory	13.11	74.69	38.17	16.90	11.57			0.07	21.02		169.10	4.59
Office furniture and equipment	4.15	1.78	35.20		30.34		22.18	0.08	1.77			0.01
Electrical materials	0.04	2.98	3.81	0.04	11.39		1.08		8.55	0.00	5.87	1.47
ICT items	0.36	0.15	62.22	0.00	0.86		0.22		0.02			-
Properties on Transit	0.13		0.01	71.06		170.14						-
Machine and Machinery	8.62	1,156.87	0.97		29.92		1.19	0.95	23.73		0.10	0.33
Consumable items	1.77	104.19	24.31		139.82		0.40		18.38			-
Chemicals and by-products	41.12	267.53	8.02		0.30		5.89		631.56			0.00
Total	77.07	1,670.92	291.03	96.49	254.64	170.14	31.32	1.11	705.75	0.00	175.07	34.06
Share (%)	2.20	47.64	8.30	2.75	7.26	4.85	0.89	0.03	20.12	0.00	4.99	0.97

The “Building” category encompasses associated infrastructure, including road networks and water treatment lines.
Source: Survey data, 2022 and 2023.

Joint operations between the Ethiopian National Defense Forces (ENDF) and the EDF total US\$705.75 million (20.1%), significantly affecting inventory (US\$169.10 million), electrical materials (US\$8.55 million), and machinery (US\$23.73 million). These coordinated efforts led to extensive destruction, frequently involving looting, dismantling, and the burning of industrial facilities assets.

ENDF (Ethiopian National Defense Forces) alone is responsible for US\$291.03 million (8.3%), mainly damaging vehicles (US\$117.88 million), ICT items (US\$62.22 million), and office furniture (US\$35.20 million), indicating targeted attacks on mobility, communication, and administrative infrastructure. Meanwhile, EFP (Ethiopian Federal Police) contributed US\$254.64 million (7.3%), mainly impacting consumables (US\$139.82 million), office furniture (US\$30.34 million), and electrical supplies (US\$11.39 million). The pattern suggests EFP involvement in asset seizure and destruction at facilities, often linked to the so-called “law enforcement activities” contexts.



Destruction of Office Assets – Semayata Dimension Stone Factory, Wukro (Nov 2020) Office furniture and equipment were reportedly destroyed by ENDF forces, disrupting administrative functions and operational continuity at the civilian facility. Source: CITG Surveys (2022, 2023)

Oromia Regional Forces (ORM) are connected to US\$170.14 million (4.9%), mainly involving goods in transit, which highlights the vulnerability of mobile assets to regional actors during conflict. Meanwhile, Afar Regional Forces (AFR) are linked to US\$96.49 million (2.8%), with significant damage to buildings (US\$8.48 million), inventory (US\$16.90 million), and goods

in transit (US\$71.06 million). These numbers indicate localized but impactful destruction, especially along transit corridors and areas under Afar control.

Amhara Regional Forces (AMH) caused damages worth US\$77.07 million (2.2%), affecting buildings (US\$3.14 million), office furniture (US\$4.15 million), and chemicals (US\$41.12 million). Although their financial contribution is comparatively smaller, the variety of affected areas suggests extensive disruption. Illegal armed groups, responsible for a lesser share (US\$31.32 million, 0.9%), caused damage in several categories, including consumables (US\$0.40 million) and office furniture (US\$22.18 million). Their role highlights the complexity of asset insecurity amid lawlessness. Other combined operations account for US\$34.06 million (1%), with impacts across various categories.

Overall, the data reveal that armed groups, particularly EDF, are the primary drivers of catastrophic damage, while domestic security forces are involved in smaller-scale incidents. The Tigray manufacturing sector suffered extensive, systematic destruction and looting, executed by two distinct groups of Eritrean forces, each with specialized roles and capabilities.

The first group consisted of armed military personnel equipped with heavy weapons and military vehicles. This group functioned primarily as a destructive force, employing indiscriminate violence to eliminate assets in their path. Their operations involved killing personnel, destroying facilities, and burning machinery and raw materials with the explicit intent of rendering the production capacity of the factories non-functional. The scale and intensity of their actions indicate a deliberate strategy aimed at crippling the industrial infrastructure of Tigray, rather than incidental damage during armed conflict.

The second group comprised civilian technicians with specialized technical knowledge of machinery. These civilians systematically identified high-value machines and equipment, carefully dismantling critical components with the assistance of cranes, forklifts, and other heavy-handling equipment. The machinery and parts deemed most valuable were then transported to Eritrea. In cases where equipment was too large or complex to dismantle efficiently, civilian technicians coordinated with the armed EDF personnel to destroy the machines using timed explosives. This coordination demonstrates a high level of planning and premeditation, with civilian expertise facilitating targeted destruction while armed forces executed the physical demolition. The combined actions of these two groups ensured both the looting and the complete incapacitation of key industrial assets. All these examples highlight

the importance of independent verification and thorough documentation to gain a complete understanding and accountability.

Case study: A destruction of Semayta Dimension Stone Factory

A case study at the Semayta Dimension Stone Factory provides a stark illustration of the human and material costs of this operation. Factory guards who attempted to prevent the destruction of heavy machinery—assets clearly of civilian and industrial use—were killed by armed Eritrean forces, according to witness provided by victims' families. Following this violent suppression, no further organized attempts to resist the armed EDF were reported. However, some isolated acts of resistance were documented against accompanying civilian technicians, suggesting that local workers recognized the deliberate nature of the looting and attempted to intervene despite the extreme risks involved. Eyewitness testimony indicates that the deliberate targeting of industrial infrastructure was part of a broader strategy aimed at punishing Tigrayans and facilitating their permanent displacement from the region. According to statements attributed to EDF personnel, the destruction of Tigray's economic base was viewed as the most cost-effective method to force the population to evacuate. By dismantling and removing machinery, the perpetrators eliminated the livelihoods of local residents, thereby creating conditions that compelled Tigrayans to abandon their homes and communities. This calculated approach reflects a strategic objective to undermine the region's industrial and economic resilience while asserting unchallenged control over both people and resources. The repeated assertion by EDF forces of their ability to act with impunity further underscores the intentionality behind these operations and highlights the broader consequences for regional economic stability.

Visual documentation provides further evidence of the systematic nature of these operations. Figure 17 illustrates a military uniform left behind at the scene of a looted and burned manufacturing facility, symbolizing the presence and coordination of armed forces during the destruction. The combination of heavy military action and technically skilled civilian intervention enabled the perpetrators to both appropriate valuable machinery and ensure the total incapacitation of remaining assets. The dual approach strategic looting combined with targeted destruction represents a sophisticated method of economic warfare, designed to inflict long-term damage on the industrial capacity of Tigray.

In conclusion, the destruction and looting of machinery in Tigray's manufacturing sector were the result of highly coordinated operations involving both armed forces and technically skilled civilians. The armed group executed widespread destruction and intimidation, while civilian technicians selectively dismantled and exported critical equipment. Case studies and eyewitness reports demonstrate that these actions were deliberate, targeted, and intended to dismantle the region's economic infrastructure and forcibly displace Tigrayans. The combined effect of these operations was the near-total destruction of key industrial facilities, the loss of livelihoods for thousands of workers, and significant long-term implications for the region's economic recovery and stability. The events reflect a systematic strategy that integrates military force and technical expertise to achieve both immediate destruction and enduring economic disruption.



EDF Military Uniform Found at Semayata Dimension Stone Factory – Wukro (2020) Military attire belonging to Eritrean Defence Forces (EDF) was reportedly identified at the site of the destroyed civilian facility, reinforcing evidence of direct involvement. Source: CITG Case Studies (2022, 2023)

The question of why the perpetrators carried out such devastating attacks on non-military industrial targets remains puzzling. To understand the motivations behind these actions, we conducted a detailed case study on selected manufacturing firms. The findings indicate that the invaders, particularly the Eritrean Defense Forces (EDF), exhibited a clear and deliberate interest in these industries, often expressing their intentions both verbally and in written

communications. The systematic destruction of public-oriented industrial facilities in Tigray by the EDF can be summarized as follows:

Seek cumulative revenge for 1998–99 grievances: The attack seems to be part of a deliberate strategy aimed at exacting cumulative revenge against the Tigrayan population, stemming from longstanding grievances dating back to the 1998–99 conflict. This retaliatory intent reflects a profound desire to punish not just particular individuals or groups, but the community as a whole, fostering a widespread atmosphere of fear, intimidation, and insecurity.

Systematically roll back Tigray’s century of development: The actions undertaken appear to be deliberately and systematically engineered to set back Tigray’s economic, social, and historical development by up to a century. This intentional strategy targets the region’s foundational structures, including its industrial base and critical infrastructure, effectively eroding decades of progress. Through the destruction of manufacturing facilities, looting of assets, and contamination of essential resources, the perpetrators are not only halting current economic productivity but also severely undermining the region’s long-term capacity for growth and self-sufficiency...

Destroy Tigray’s economic foundations from ethnic hostility: The campaign represents a deliberate and systematic effort to dismantle Tigray’s economic foundations, motivated by deep-seated hostility toward the Tigrayan people. By targeting and destroying industrial assets in a coordinated manner, the perpetrators (EDF) aim to strip communities of livelihoods, financial capital, and institutional capacity, thereby undermining the region’s economic resilience and long-term development potential.

Exploit crisis to permanently cripple Tigray’s recovery: The current period is being used as a strategic opportunity to permanently undermine Tigray’s recovery capacity. Certain actors (EDFs) are intentionally targeting critical infrastructure and economic assets to weaken resilience and block reconstruction efforts. By destroying manufacturing facilities, disrupting supply chains, and fragmenting governance structures, they are creating long-term structural barriers that extend well beyond the immediate physical damage.

To hinder Tigray’s growth and parity with Eritrea: The deliberate actions appear aimed at preventing Tigray’s economic growth and reducing it to the same level of development as Eritrea, driven by the belief that Tigrayans conspired against Eritrea over the past two decades. This perception has been manipulated to rationalize economic isolation, industrial destruction, and systematic obstruction of reconstruction efforts.

To showcase military dominance and justify unrestricted actions both regionally and domestically: The campaign also serves to demonstrate military dominance both regionally and domestically, reinforcing a perception of unchallenged authority and legitimizing actions carried out without restraint.

To impose moral humiliation and psychological trauma, fostering a sense of inferiority in Tigrayan communities: To deliberately inflict moral humiliation and psychological trauma on Tigrayan communities, aiming to break their collective spirit and sense of dignity. This involved systematic destruction of the economic bases and create a lasting feeling of inferiority.

In addition, Amhara forces reportedly targeted public inventories with the following aims:

To undermine Tigray's economic foundations: To deliberately undermine Tigray's economic foundations, targeting key sectors, infrastructure, and industrial livelihoods essential for regional stability and growth. This strategy aimed to disrupt production, and employment, weakening both local businesses and the broader economic network. By destroying industrial facilities, the intent was to reduce Tigray's self-sufficiency and capacity to recover independently.

To punish civilians seen as TPLF-aligned by treating all Tigrayans as combatants: To punish civilians perceived as aligned with the TPLF, all Tigrayans were broadly and indiscriminately treated as combatants, regardless of age, gender, or actual involvement in hostilities. This approach blurred the line between civilians and fighters, exposing entire communities to violence, displacement, and loss of property.

To seize Tigray's resources, exploiting the conflict for strategic and political gain: To seize Tigray's resources, actors exploited the ongoing conflict to gain both strategic and political advantage. Key assets including industrial facilities were targeted for appropriation, looting, or destruction, undermining the region's economic autonomy.

Loss by category

The scale of damage and destruction sustained by the manufacturing sector is significantly high. Without full compensation for replacement costs, it will be extremely difficult for the sector to recover to its pre-war status, let alone to advance beyond. The most severe impact of the Tigray war on the manufacturing sector stems from the economic losses resulting from the destruction of production assets and the complete blockade sustained over three consecutive fiscal years. The following section presents a detailed valuation of the various levels of loss, including additional costs incurred by businesses and foregone economic opportunities.

Production and sales loss estimation

Since the outbreak of the war, manufacturing enterprises in Tigray have ceased production and have been unable to carry out their usual business operations. This off-production status resulted from both the severe destruction of production facilities and a complete economic blockade. The impact of the blockade, in particular, has been extremely serious, contributing to significant and multidimensional economic losses. Production reduction data for the years 2020/21 and 2021/22 were gathered from manufacturing enterprises during the survey period. The resulting losses in production, as well as the corresponding losses in sales and profits, were calculated by comparing them with baseline production volumes and sales values from the pre-war period (2018–2020).

To ensure validity, the average production volume of each manufacturing enterprise over the three years preceding the war was used as a benchmark. Production volumes during the war and blockade period were obtained through a structured survey. The difference between each year's actual production during the conflict and the pre-war three-year average reflects the extent of production decline attributable to the war and the blockade. Technically, the war period is defined as spanning from November 4, 2020, through 2022. A significant number of respondents from the manufacturing sector cited the war and complete economic blockade as the primary reasons for production loss. Notably, the impact of the blockade on production loss was reported to be greater than that of physical damage. This suggests that the severity of the sector's disruption was driven more by the economic blockade than by direct destruction caused by active combat.

Sales losses for the years 2020/21 and 2021/22 were calculated by multiplying the quantity of goods not produced due to the war and the blockade by the respective local market prices of each item. Although active combat has subsided, economic blockades and ongoing atrocities persist in some parts of the Tigray region, the manufacturing sector has been unable to resume normal operations or address its challenges. Consequently, sales losses have continued to rise, exacerbated by inflation. The estimated sales loss for 2022/23 was adjusted based on the 2021/22 figures, reflecting inflationary pressures. The total sales loss from 2020/21 to 2022/23 represents the cumulative impact of both the war and the continued economic blockade.

Profit/ loss estimation

The data for this survey is taken from big private manufacturing sector of Tigray. In general, the goal of private sector is to generate profit through producing and selling of industrials

products. Due to the active war and blockage, the production momentum as well as the expected sales and profit of the firms were cut off. The manufacturing sectors encounter two types of losses. The first type of revenue loss is from missing direct transaction of the finished products. The second category of loss occurs following the deduction of direct and indirect costs, the manufacturing firm anticipating the remaining amount as net profit.

The approach followed to estimate the profit/ loss is consistent to the production loss assessment. Take the average value of profit in prewar three years (2018-2020). The actual profit for 2020/21, and 2021/22, were collected from the survey and calculate the loss in net profit by computing the difference between the respective year net profit (which is missed in effect) and average of the three years profit (2018-2020). The 2022/23 net loss is estimated by price adjustment in reference to the 2021/22 loss value. Figure 13 shows pre-war and post war net profit for the manufacturing firms of Tigray. The loss in profit even in the pre-war period was decreasing, though positive value. This is quite intuitive. This is because economic momentum of big manufacturing sectors was not limited to Tigray only; rather their activities were expanded to the national and international market for instance company of EFFORT¹². On the other hand, political unrest and economic instability of the country (Ethiopia) has started since 2018. This national political instability affects big manufacturing firms of Tigray in two ways. First, due to disruption of security throughout the country, back war and forward transaction linkage of Tigray manufacturing firms were affected. Second, some big manufacturing firms were participated in exporting finished industrials products for external market through African Growth and Opportunity Act (AGOA). Due to the internal political instability, directly and indirectly the international transaction and overall economic performance of the big manufacturing firms was seriously affected. Thus, it is reasonable that manufacturing firm's net profit has shown a declined trend before the war, but the loss severity is high during the war and siege period.

¹² Endowment for the Rehabilitation of Tigray

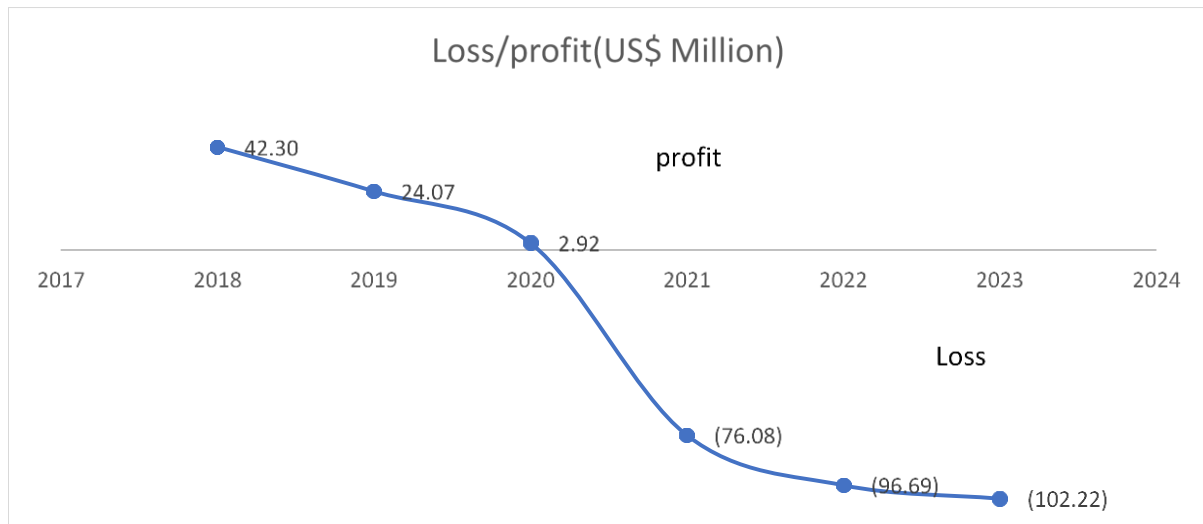


Figure 13. Comparison of pre- and post-war profit (Birr)
Source: Survey 2022 and 2023.

From 2018 to 2020 there was a positive profit while decreasing across the three years (downward slop in the first quadrant). This has been completely changed during the war and siege period (2021-2023), the profit is negative and decreasing at an increasing rate (down war slope in the fourth quadrant). Therefore, the total loss of the manufacturing sector for the three years (war+ blockade) accounts (15,616,705,415.19) US\$.

Unforeseen loss/ additional costs

Sales losses presented above are based on the direct reduction in production and were calculated using a linear approach. However, beyond these direct losses, the war and blockade also exposed manufacturing enterprises to various unforeseen and indirect costs. These indirect losses were identified through survey responses in which enterprises were asked to report the types and extent of additional losses incurred during the war and blockade period.

Asset destruction significantly disrupted supply chains within the manufacturing sector, resulting in increased operational costs. These costs are estimated and interpreted as part of the short-run impacts, particularly the rising burden of unforeseen expenses. The sector-wide losses had a detrimental effect on production continuity, largely due to the three-year suspension of economic activity, which led to critical shortages of inputs, spare parts, and utilities, as well as disruptions in communication and sales networks.

The underlying assumption is that, in the absence of war and blockade, the likelihood of incurring such additional costs would have been extremely low, or non-existent. In practice, however, manufacturing enterprises incurred unavoidable expenses that are considered part of their overall losses. These additional costs increased steadily over the three-year period, further

exacerbating the burden on the region's manufacturing sector. The unforeseen costs can be grouped into four main categories:

1. **Repair Costs:** This includes expenses for repairing partially damaged machinery, vehicles, buildings, and other production-related infrastructure necessary for resuming operations.
2. **Replacement Costs:** These are expenditures for purchasing replacement parts and materials that were damaged or lost.
3. **Rental Costs:** In cases where enterprises attempted to restart operations despite damage, some had to rent machinery, equipment, or facilities to resume production at a minimal level.
4. **Humanitarian Expenses:** These costs were directed toward supporting vulnerable employees and community members during the war, including provisions for food, shelter, and medical support.

Table 143 presents the types and corresponding values of these unforeseen costs incurred during the war and blockade period. The largest share of the additional costs was attributed to purchasing cost of partially damaged manufacturing assets, accounting for 40.9% of the total. This was followed by repairing of the partial damaged tools and materials expenses, which made up 39.7 % of the total unforeseen costs.

Table 143. Unforeseen cost of the manufacturing sector (US\$ in Millions)

Type of costs	Additional cost Value (US\$ in Millions)	Percent
Repair cost	333.34	39.8
Rental cost	56.89	6.8
Purchase cost	342.50	40.9
Humanitarian expenses	105.66	12.6
Total	838.39	100

Source: Survey 2022 and 2023.

Forgone Loss Value

Tigray war has impacted not only existing businesses and ongoing operations, but also disrupted potential sources of future wealth and income for individual enterprises, the region, and the country as a whole. In the absence of the conflict, numerous development projects and contractual engagements were in the pipeline, scheduled for implementation in Tigray. These

initiatives represented significant opportunities for economic growth, employment generation, and regional development.

However, due to the devastating impact of the war, these planned projects were never implemented, resulting in significant missed opportunities and benefit packages for the manufacturing sector in particular. Technically, the losses resulting from the collapse of these projects and contracts were estimated indirectly, using the concept of opportunity cost, which defines as the loss of potential benefit that could have been gained from the next best alternative use of resources. In this context, it is assumed that, had the war not occurred, the projects and contracts intended for implementation in Tigray would have proceeded as planned and generated their expected returns primarily in the form of profits. In reality, these projects were abandoned and their potential economic benefits were entirely foregone. Alternatively, if the financial value of these projects and contracts had been redirected to other viable economic activities (which did not happen), the benefits from the second-best alternatives would serve as the basis for estimating the losses using standard opportunity cost methods. Accordingly, the unrealized value of the collapsed projects is considered a loss to the enterprises and is calculated based on the potential earnings that could have been generated if the project or contract value had been invested in the region between 2021 and 2023. On average, the manufacturing sector in Tigray suffered a suspension of projects with value estimated at US\$ 314.90 million.

Similarly, prior to the outbreak of the Tigray war, numerous contractual agreements had been established between manufacturing enterprises within Tigray and with partners outside the region. A significant number of contracts were signed between two or more enterprises, aimed at facilitating the supply of raw materials, industrial accessories, and development of administrative services. Assessing the current status of these contracts and estimating the benefit value incurred by the contract parties was a critical part of the analysis. As with the collapsed development projects, the war led to the termination of many of these contracts, resulting in substantial economic losses. The manufacturing sector in Tigray is estimated to have suspension of a contract value approximately US\$ 261.83 million due to the collapse of these agreements.

Government and vulnerability loss

The war in the Tigray region of Ethiopia, which escalated in late 2020, serves as a poignant example of significant government losses during and post-war period within the country's

complex political landscape. This conflict led to substantial public losses for the Tigray regional government, inflicting heavy casualties on Ethiopian troops and straining military resources. The ensuing humanitarian crisis saw millions displaced and facing famine, with the government's inability to provide adequate assistance further eroding public trust and support. Ultimately, the entire Tigray economy has suffered from destruction of the infrastructure, and disruption of the supply chain and economic transactions at large. Manufacturing sector of Tigray is one among the other that significantly affected by the war. In Tigray, industrial sector has a public wing as well. Specifically, Bureau of Industry and Investment commission of Tigray. The main duties of these public institutions are to support and provide administrative guidance to the private manufacturing sector. In the meantime, these sectors are also affected by the war and demand appropriate recovery and reconstruction interventions. Recovery and developing institutional capacity so as to take care their responsibilities is one pillar of the public industrial oriented institution. Even after the active war is stopped the private manufacturing sectors is yet not recovery and unable to back to the prewar status. These institutions incurred huge amount of resource for administrative purpose and intervention to revive the sector at large. For these purposes, the loss is analyzed in to the government and vulnerable loss perspective.

Government loss

To rehabilitate and revive the private manufacturing sector bureau of Industry and Investment Commission of Tigray mobilized resource in every fiscal budget. The type of intervention and extent of public expenditure to restore the Tigray differs across the two public institutions, thus for brevity we treat them separately.

This public institution has experiences loss of resource across since the ignition of the war November 2020, up to 2025. This is because until the damaged infrastructure are reconstructed and recovered the disrupted economy, the government outlays continuously to restore and rehabilitate the sector within three years. Effect this, the pattern of the loss is depicted in Table 144.

Table 144. Government loss of the Bureau of Industry and Investment Commission (US\$ in Millions)

Activities /interventions	Governance Loss		Total Loss	Share (%)
	Bureau of Industry	Investment commission		
Coordinating efforts	0.13	0.04	0.16	10.61
Restaffing of the industrial staffs	0.04	0.02	0.06	3.62
Induction training for damaged sectors	0.11	0.04	0.14	9.36
Redeployment of reviving resources	0.04	0.01	0.05	3.27
Restructuring of the institution	0.01	0.00	0.01	0.85
Restoring archives	0.02	0	0.02	1.53
Restoring Database system of the institution	0.02	0.04	0.07	4.39
Mobilizing, workshops	0.12	0	0.12	7.70
Transporting basic tools	0.02	0	0.02	1.60
Temporary facility transfer/gift	0.04	0	0.04	2.40
Technical support to restore the sector	0.05	0.00	0.05	3.13
Common platform for coordinated action	0.03	0	0.03	1.83
Exhibitions, Symposium	0.67	0.01	0.68	43.87
Experience shares and lessons	0.07	0.02	0.09	5.84
Total	1.38	0.17	1.55	100.00

Source: CITG survey, 2022 and 2023

Table 144, quantifies the financial costs expressed in millions of US dollars (US\$ million)—incurred by Tigray's Bureau of Industry and Investment Commission to restart their operational activities following the devastating impacts of the 2020–2022 Tigray war. The table specifically focuses on "governance losses," which represent the direct and indirect costs associated with disruptions to administrative structures, decision-making processes, and institutional recovery efforts. These losses encompass expenses for rebuilding coordination mechanisms, human resources, data systems, and collaborative initiatives disrupted by the conflict, which severely damaged infrastructure, displaced personnel, and eroded institutional memory in the region. The data is broken down by activity/intervention across the two key offices (Bureau of Industry and Investment Commission), with subtotals for each entity's contribution, a combined total cost, and the percentage share relative to the overall expenditure. This breakdown highlights the disproportionate burden on the Bureau of Industry, which bore the majority of the costs due to its broader mandate in overseeing industrial operations, while the Investment Commission focused more on recovery in investment facilitation and regulatory functions.

The total governance loss across all activities amounts to US\$1.55 million, with the Bureau of Industry accounting for US\$1.38 million (89%) and the Investment Commission for US\$0.17 million (11%). This stark disparity underscores the war's heavier toll on industrial oversight, where frontline recovery efforts like staffing, training, and resource mobilization were more resource-intensive amid widespread destruction of manufacturing facilities and supply chains

in Tigray. The largest single contributor was "Exhibitions, Symposium" at US\$0.68 million (43.87% share), primarily driven by the Bureau of Industry's US\$0.67 million expenditure; this reflects the high costs of organizing post-war events to reconnect stakeholders, showcase recovery progress, and attract investors in a region isolated by the conflict. Other significant interventions include "Coordinating efforts" (US\$0.16 million, 10.61%) and "Induction training for damaged sectors" (US\$0.14 million, 9.36%), both critical for reestablishing policy alignment and workforce capacity. Smaller but essential costs arose from "Restoring archives" (US\$0.02 million) and "Restoring Database system" (US\$0.07 million), with the Investment Commission playing a larger relative role in the latter due to its dependence on digital records for licensing and compliance.

Risk and Vulnerability loss

Risk and vulnerability loss in public industrial organizations refers to the potential or actual damage these institutions face due to the war. Such losses can manifest financially, operationally, and reputationally. Public organizations are especially prone to these risks because they operate in complex political, social, and economic environments and are often constrained by rigid bureaucracies. One major source of vulnerability is the uncertainty of the private manufacturing sector in Tigray. Financial risks also pose significant threats, particularly through loan constraints, as the manufacturing sector operators have occurred a loss. Political instability or abrupt policy shifts can derail ongoing reforms and discourage both public engagement and donor support. In war -prone or post-conflict regions like Tigray, public institutions may also suffer from looting, destruction of assets, displacement of employees, and loss of critical records resulting in long-term institutional and economic setbacks.

These compounded risks can lead to significant losses in terms of financial resources, service delivery, institutional credibility, and human capital. To mitigate these risks, public organizations must adopt proactive strategies such as risk assessments, staff capacity building, emergency response planning. Ultimately, managing risk and reducing vulnerability requires strong leadership, transparency, community involvement, and a culture of accountability embedded within the public sector. Next, how the two public institutions enable to mitigate the risk and vulnerability (Table 145).

Table 145. Risks and Vulnerabilities of Bureau of Industry and Investment commission (US\$ in millions)

Activities	Risk and Vulnerability Cost (US\$ in Millions)			
	Investment commission	Bureau of Industry	Tot al	Share (%)

Identifying possible risks (manpower used to identify risk of commission)	0.01	0.01	0.02	1.23
Organizing forums against further risk (number of forums)	0.17	0.17	0.34	19.21
Assessing to mitigate risk	0.07	0.06	0.13	7.37
Communication campaigns of preventing risk (communicating to federal institutions)	0.25	0.22	0.47	26.76
Preventing risk (communicating to federal institutions)	0.00	0.00	0.00	0.00
Resource Mobilized to manage risk (cars and manpower used for field work)	0.07	0.05	0.12	6.77
Disseminating basic service to minimize risks	0.09	0.09	0.18	10.08
Coordinating to prevent further risk	0.09	0.09	0.19	10.71
Securing the working and selling areas	0.16	0.16	0.32	17.87
Total	0.92	0.85	1.77	100.00

Source: CITG Survey, 2022 and 2023

As indicated in Table 145, the risk management and vulnerability mitigation costs incurred by the same two offices Bureau of Industry and Investment Commission during their post-war restart phase. These costs, totalling US\$1.77 million, reflect proactive and reactive expenditures aimed at preventing recurrence of war-related disruptions, securing operational continuity, and rebuilding stakeholder confidence in an environment still marked by political instability, federal-regional tensions, and physical insecurity. Unlike Table 144's focus on *governance restoration*, Table 145 emphasizes *forward-looking resilience*: identifying threats, communicating warnings, mobilizing resources, and securing industrial and investment zones. Notably, costs are more evenly distributed between the two entities (US\$0.92 million for Investment Commission, US\$0.85 million for Bureau of Industry) than in governance losses, indicating shared responsibility in risk prevention, particularly in public communication and physical security.

The largest expense was "Communication campaigns of preventing risk" at US\$0.47 million (26.76%), split nearly evenly between the two offices (US\$0.25 million and US\$0.22 million). This high allocation underscores the critical role of strategic messaging especially to federal institutions in Addis Ababa to counter misinformation, bureaucratic obstruction, or renewed hostility that could derail recovery. In a context where Tigray remained under de facto blockade and federal agencies were perceived as complicit in the war, such campaigns were essential to negotiate access, clarify policy, and prevent sabotage. Similarly, "Organizing forums against further risk" (US\$0.34 million, 19.21%) and "Securing the working and selling areas" (US\$0.32 million, 17.87%) both jointly funded reveal a heavy investment in dialogue platforms and physical protection, including private security, perimeter fencing, and coordination with local militias to safeguard factories, warehouses, and investment promotion events.

Impact of the war Industry sector

Impact on employment

The industrial sector in Tigray was a key driver of employment for the local labor force, particularly in the textile industry, construction on small and micro enterprises. Prior to the war in 2020, the sector provided job opportunities for approximately 184,144 individuals. However, due to the war, employment in the manufacturing sector dropped sharply to 13,225 in 2021, and further declined to 12,078 in 2022 (see Figure 19 below). This drastic reduction highlights the severe impact of the war on the region's industrial labor force and its capacity to sustain livelihoods.

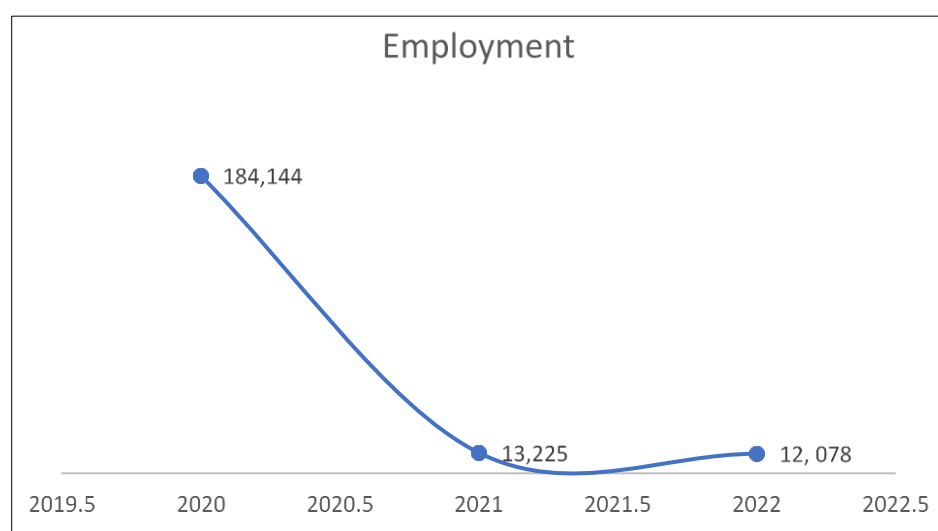


Figure 14. Employment in the manufacturing sector
Source: Survey 2022 and 2023.

The impact of the war extends beyond the dissolution of the industrial labor force and the shutdown of the enterprises. A significant number of industrial workers became direct victims of the war with traumatized mentally, psychologically, physically, and emotionally. In 2021 alone, about 10,013 employees from the Tigray industrial sector become victim of the war in various ways. These figures highlight the deep human cost of the war, compounding the economic devastation with lasting personal and social consequences for the industrial workforce.

Impact on macroeconomic variables

Tigray war has had a profound crowding-out effect on key macroeconomic variables. It significantly weakened the tax collection capacities of both the federal and regional

governments, triggered a sharp decline in export earnings and hard currency inflows, and severely deterred both foreign direct investment (FDI) and domestic investment. These losses are assessed in terms of the benefits forgone, measured against the sector's pre-war performance.

In the absence of the war, the regional manufacturing sector was expected to sustain if not surpass its economic contributions relative to the pre-war period. However, since November 2020, the sector's potential contribution to these macroeconomic variables has dropped to virtually zero, as illustrated in [Table 146](#).

Table 146. Impact of war on macro-economic variables (US\$ in Millions)

Macro variables	Value (US\$ in Millions)		
	2020(Pre-war Period)	2021	2022
Export	7.19	-	-
Hard currency	16.91	-	0.00
Federal Tax	19.85	0.43	0.00
Regional Tax	283.08	0.30	0.01
FDI	43.73	0.00	-
Domestic Inv'	169.25	-	-

Source: CITG Survey, 2022 and 2023.

2.3.3 Conclusions and Recommendations

Conclusions

This damage and loss assessment report provides insight into the severity and far-reaching consequences of the Tigray war on manufacturing sector and the broader macroeconomy of the region. The negative impacts are reflected not only in the physical destruction of assets but also in the widespread economic consequences, including reductions in production, sales, and profits, as well as additional costs, opportunity costs, and human loss.

The value of directly damaged or destroyed properties was estimated based on owners perceived market values specifically, replacement costs at the time of the survey. To ensure accuracy and reliability, critical validation steps were undertaken to confirm that these owner-reported values serve as a credible proxy for actual market values. Meanwhile, the indirect damages particularly economic losses were extensive. These losses were calculated for the two years of war and siege (2020/21 and 2021/22), reflecting the prolonged disruption and devastation experienced by the region's manufacturing sector. However, in effect the blockage is continued for the fiscal year 2022/23 as well. Pretty enough, the expected loss for the 2022/23 is adjusted inference to one year market price variation from 2021/22 to 2022/23. To this end, the indirect loss value is higher than the direct physically damaged property's value. The report attempts to incorporate all types of damages, losses, additional and opportunity costs in a monetary term and the total cost of the war on the manufacturing.

The data used to estimate the damage and loss values for the manufacturing sector were collected through comprehensive survey. However, it is important to note that this report presents only a partial picture of the full impact. As approximately 40% of Tigray remains under the control of invading forces, manufacturing enterprises in those areas have not been fully included in the assessment. The damage and loss values for each manufacturing department or unit were estimated based on conditions observed during the survey period (2022-23). To account for inflation, the 2022/23 loss estimates were adjusted using changes in the national Consumer Price Index (CPI) between 2022 and 2023¹³. The working capacity of the manufacturing sector remains critically low, about 68.23% of enterprises operating at less than 25% of their pre-war capacity. This highlights the urgent need of substantial investment in rehabilitation and reconstruction to restore the sector.

¹³ The CPI used for adjusting the 2023 sales loss was 1.33, implies the revenue loss of 2022 is multiplied by 1.33.

Despite its limitations, this report offers valuable technical insights and serves as a foundational reference for recovery planning and resource mobilization.

First, the means, types, of execution and perpetrators, and the subsequent outcome of the damage is contextually and exhaustively assessed. It will be used as an input for demanding justices when accountability comes to effective.

Second, the victims of the war are explicitly non-military and consist solely of public objective entities or units. These victims have a legal right to claim full compensation, at minimum sufficient to restore their businesses to their pre-war status. This report serves as essential and foundational evidence to support such claims. Various compensation modalities for the damages and losses have been thoroughly assessed, and the affected manufacturers have expressed their interest in receiving timely and appropriately targeted interventions.

Third, it is important to emphasize that the war in Tigray ever had not occurred, nor should it never happen again. A comprehensive documentation of the outcomes and impacts of such conflicts can serve as a valuable lesson both for the people of Tigray and the international community.

Fourth, the findings of this report can serve as critical baseline data to guide the reconstruction and revitalization of the manufacturing sector, aiming not only to restore it to its pre-war status but to build a more resilient and prosperous future.

Recommendation

Given the unprecedented levels of damage and destruction of the sector, it is clear that the recovery, reconstruction, and development of Tigray industrial industry (mainly private) will come with significant financial resources. But, due to the heterogeneity and current status of the sector, it may be difficult to outline uniform recovery and reconstruction intervention as well. Global experience has identified five key steps to successfully recover from damage, loss, and stagnation in the industry.

Understand the needs of each and every industry: Understand the unique needs, challenges, and opportunities of each and every industry to design tailored strategies, foster innovation, enhance productivity, and promote sustainable growth across all sectors.

Develop a comprehensive recovery plan: Develop a comprehensive recovery plan that outlines strategic actions to restore economic stability, rebuild damaged infrastructure, and

revitalize affected industries. The plan should include clear short-term and long-term goals, prioritize resource allocation, and establish mechanisms for monitoring progress. It must also emphasize inclusivity, ensuring that all sectors, especially small and medium enterprises, receive adequate support.

Build inclusive and resilient institutions: Build inclusive and resilient institutions that promote transparency, accountability, and equitable participation of all stakeholders. Strengthen governance systems to ensure fair decision-making, effective service delivery, and public trust.

Finance the recovery, and rehabilitate the seriously damaged industry: Finance the recovery and rehabilitate the seriously damaged industries through coordinated investment strategies, mobilizing both public and private resources. Establish financial mechanisms such as grants, soft loans, and credit guarantees to support affected enterprise

Implement the recovery programs in a coordinated manner with high levels of accountability and transparency: Implement the recovery programs in a coordinated and systematic manner, ensuring alignment among government institutions, private sector actors, and development partners.

Thereafter, the government and developmental partners are expected to implement a series of interventions under the framework of Industrial Repair Program (IRP).

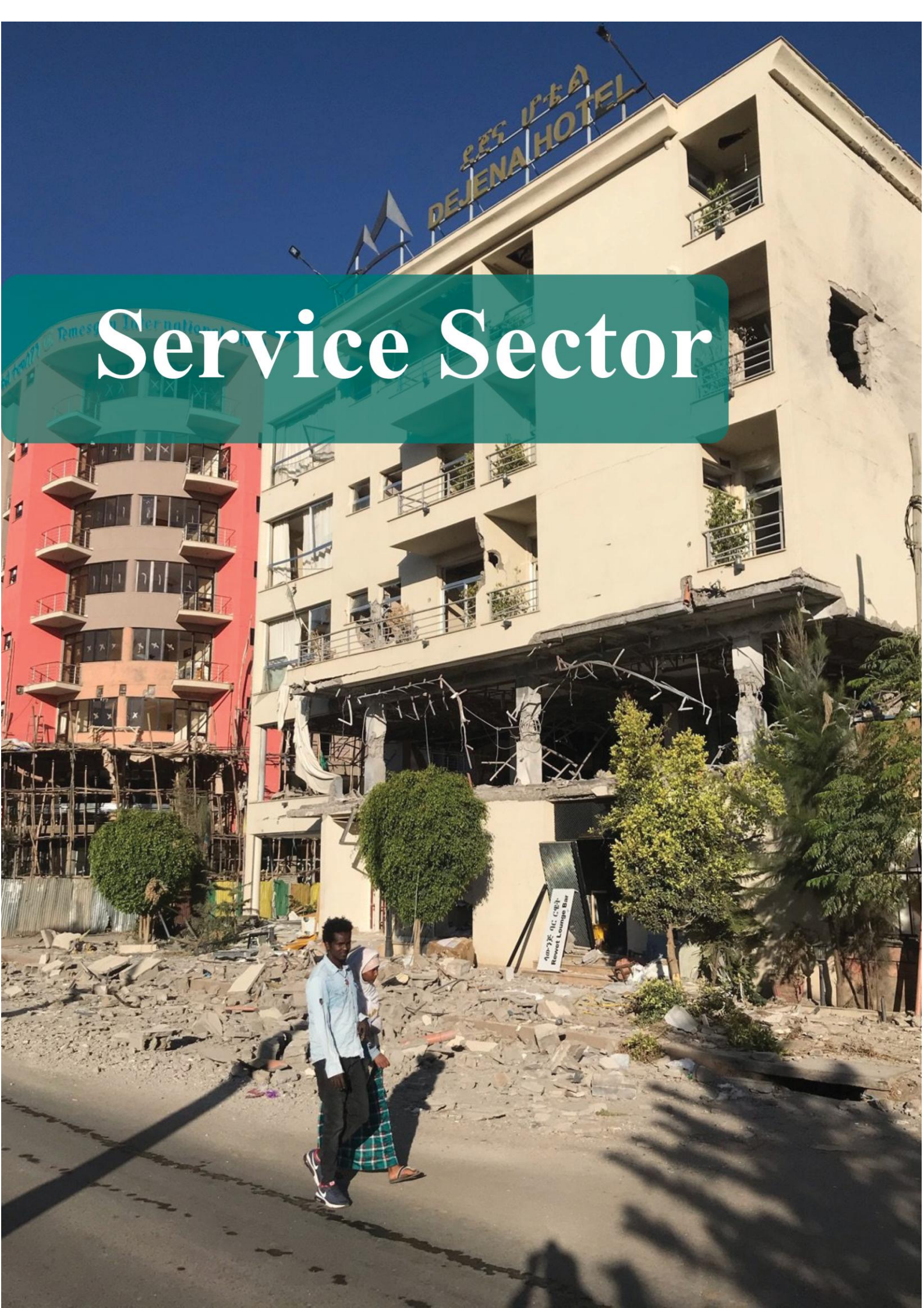
The IRP includes:

- i. Provide loan grants to micro, small, and medium enterprises (MSME) who have been affected by the assault. These interventions will rapidly respond to the severe damage to the private sector and help jump-start the production cycle.
- ii. Concessional loans to support rehabilitation and restoration in the private sector. Provide concessional loans to support the rehabilitation and restoration of the private sector, focusing on enterprises severely affected by conflict or crisis. These low-interest financial instruments should help businesses rebuild assets, restore production, and rehire workers
- iii. Priority Production System: As an emergency, intervene in particularly crucial sectors. In Tigray context, there are two crucial industrial subsectors to be prioritized for emergency purpose. Firstly, food industry (agro-processing) can help to meet food security of the people. Secondly, the construction subsector expected to have an active role in the reconstruction efforts of the region.

- iv. Build supporting systems (supporting laws): Specific supporting instruments varied from financial and tax support to the establishment of various supporting organizations, provision of information, and technical consulting.
- v. Provide targeted subsidies for selected industries: such as a tax break, a subsidized loan, and access to import-export loans to firms, which exhibited a great contribution to the region's reconstruction.
- vi. Initiate matching fund programs for the private sector: The government and business sectors should cover a fraction of the cost of reconstruction to ensure that they have a role in the recovery of Tigray industrial sector.
- vii. Technology, capital, and institutional reform: Attracting foreign capital and modern technology to radically escalate the region's industrial investment.
- viii. To further de-risk private sector: a subsidized insurance program can be established to mitigate security concerns.
- ix. Develop and implement a public-private partnership (PPP): Develop and implement a robust public-private partnership (PPP) framework that leverages the strengths of both sectors to drive sustainable development and post-crisis recovery. Encourage collaboration in infrastructure rebuilding, industrial revitalization, and service delivery. Establish clear policies, transparent contracts, and shared accountability to ensure mutual benefit and efficiency.

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Service Sector

2.4 Damage and Loss to Service

2.4.1 Introduction (Pre-war Context)

The service sector is a giant sector booming from time to time throughout the world and is at the forefront agenda of different countries and international organizations. However, the sector is also highly sensitive to different manmade and natural disasters. Its consistent success is highly linked to the peace and stability of a given country/region.

As stated in Table 147 at Tigray level, the service sector was among the leading economic sectors before the war. The share of Tigray economy was 37.32% agriculture, 35.96% service and 27.46% industry in 2020 (Tigray Finance and Planning Bureau, 2020). The service sector was growing at an average rate of 9.94% during the second growth and transformation plan of Tigray. As stated at the different regional documents, special attention will be given to the service sector in general and more specifically to tourism, logistics, finance and technology.

Table 147: Sectoral Distribution and Growth of Tigray Economy (2016 to 2020)

Sector	Share (%) and Growth Rate									
	2016		2017		2018		2019		2020	
	Share	Growth	Share	Growth	Share	Growth	Share	Growth	Share	Growth
Service	36.31	10.47	37.2	12.52	37.45	9.64	35.96	8.59	35.96	8.5
Agriculture	38.35	2.4	36.97	5.89	36.75	7.73	37.32	3.92	37.32	5
Industry	25.34	17.72	25.83	11.95	25.98	9.56	27.46	9.1	27.46	15.7

Source: Tigray Finance and Planning Bureau, 2020

Taking the tourism and hospitality sector in Tigray as a case; data from the Tigray Culture and Tourism Bureau (TCTB) revealed that the sector has shown great improvements from year to year. International visitors increased from 26,126 visitors in 2010 to 91,000 visitors in 2019. The numbers of domestic visitors also increased from 39,021 visitors in 2020 to 2,270,000 visitors in 2017. Receipts from international visitors increased from US\$ 24 million in 2020 to US\$ 125 million in 2019. The sector has also created jobs for 54,000 individuals in 2020. However, because of the total war in Tigray, tourist flow completely dropped from 91,000 in 2019 to Zero in 2021 in international tourists and from more than 2 million to Zero in domestic tourists. The image of Tigray as the all-seasoned, beautiful and secured tourism and hospitality destination is also spoiled and different adverse travel advisories are issued by embassies of different countries (Table 148).

Table 148: International Tourist Statistics in Tigray (2009 to 2020)¹⁴

Year	Number of domestic visitors	Number of international visitors	Length of stay	Daily expense	Annual revenue in dollar (\$)
2009	39,021	26,126	4	USD 230.00	USD 24 million
2010	42,531	29,097	4.5	USD 230.00	USD 30 million
2011	39,652	30,315	5	USD 230.00	USD 34 million
2012	57,242	34,105	5	USD 230.00	USD 39 million
2013	272,955	41,360	5.5	USD 230.00	USD 52 million
2014	702,047	59,870	6	USD 230.00	USD 82 million
2015	933,334	62,972	6.5	USD 230.00	USD 94 million
2016	2,270,000	77,000	6	USD 230.00	USD 106 million
2017	483,207	65,219	6	USD 230.00	USD 90 million
2018	No data	91,000	6	USD 230.00	USD 125 million
2019	No data	80,000	6	USD 230.00	USD 110 million
2020	-	-	-	-	-

Source: TCTB, 2021

¹⁴ The length of stay, daily expenses and annual revenues are only for international visitors.

2.4.2 Results

Respondent Profile

Before the outbreak of total war in November 2020, Tigray had been making significant efforts to engage comprehensively in all developmental areas. The service sector was among those making notable progress, contributing to improved employment quality, economic sustainability, and local prosperity. During the second growth and transformation plan, it accounted for up to 35.96% of Tigray's GDP, with an average annual growth rate of 9.94%. However, the total war, siege, and blockade dramatically disrupted these gains. Assessments show that the private service sector has been one of the hardest-hit areas by the war. The assessment findings primarily highlight the overall economic impact of the war, including property damages, service revenue losses, additional costs from increased purchase prices, maintenance, rent, and humanitarian needs. It also notes outstanding values like unpaid salaries and allowances, forgone earnings from salaries, projects, contracts, bids, and bank interest, as well as manpower damages issues.

Geographic Distribution

The zonal distribution of the collected data from the CITG Survey, 2022 and 2023, Table 149 reveals significant variation across regions. The Eastern zone contributed the largest share at 34.53% (4,456 firms), followed by the Western zone with 20.29% (2,618 firms). The South zone accounted for 13.39% (1,728 firms), while the North Western zone represented 10.69% (1,380 firms). The Mekelle zone contributed 8.80% (1,136 firms), the Central zone 6.57% (848 firms), and the South Eastern zone the smallest proportion at 5.73% (739 firms). Additionally, 209 cases lacked zonal information. This distribution reflects the proportion of data collected rather than the actual extent of damage or business concentration in each zone.

Table 149: Zonal Distribution of Collected Data

Zone	Number of Respondents	Share (%)
Central	848	6.57
Eastern	4456	34.53
Mekelle	1136	8.80
North Western	1380	10.69
South	1728	13.39
South Eastern	739	5.73
Western	2618	20.29
Missing cases	209	
Total	13114	100.00

Source: CITG Survey, 2022 and 2023

Firm Structure, Firm Size, Source of Capital/Finance

As indicated in Figure 15(a) the institutional profile of the assessed firms in the Tigray manufacturing sector reveals a structure highly predisposed to fragility, a critical finding when considering the catastrophic damage incurred. Numerically, the sector is dominated by Sole Proprietorships, which constitute an overwhelming 94.96% of the firm structure. This high degree of informality limits the sector's access to formal recovery mechanisms such as institutional grants, credit guarantees, and insurance claims, which typically require the robust legal documentation associated with more complex corporate structures.

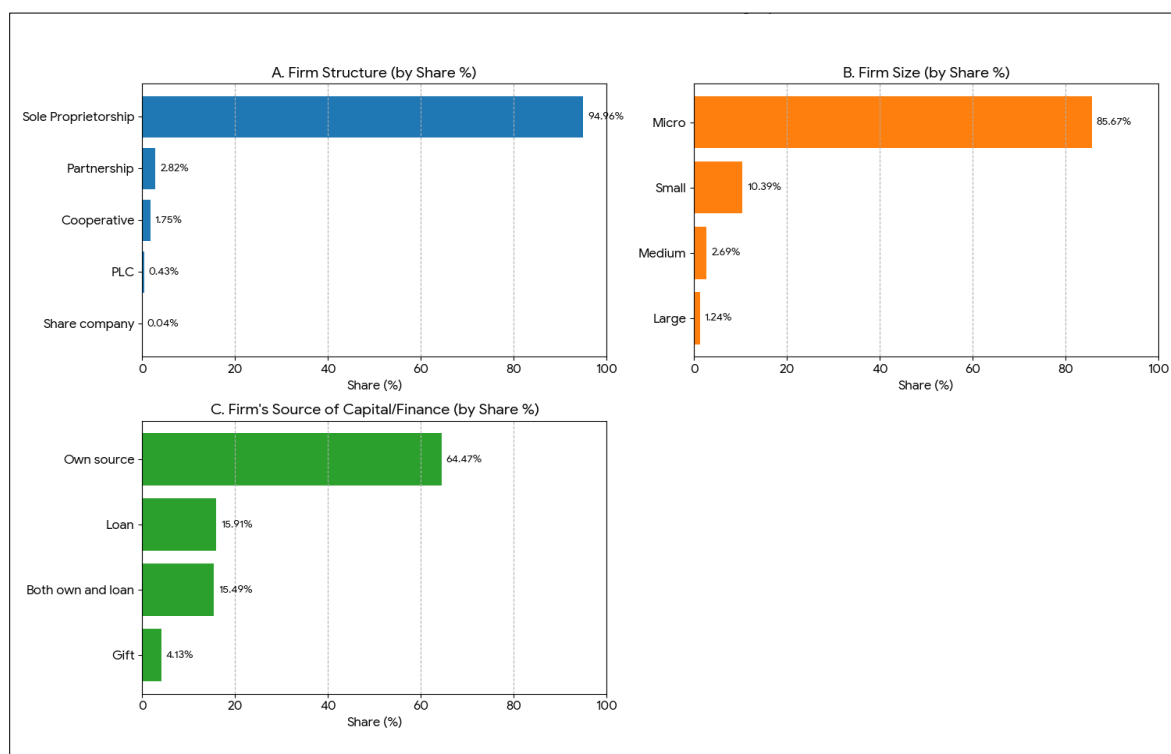


Figure 15: Firms profile A. Firm Structure, B. Firm Size, C. Source of Capital/Finance
Source: CITG Survey, 2022 and 2023

The structural vulnerability is compounded by the size distribution, where microenterprises represent 85.67% of the firms. This scale indicates low capital intensity and minimal operational buffers. While Micro firms are vital for employment, their limited size means they have little absorptive capacity for reconstruction financing and cannot easily withstand the total loss of assets reported. The concentration in this size category ensures that the widespread damage translates into an immediate, existential threat to the vast majority of firms (Figure 15(b)).

Furthermore, the sector's financial foundation reinforces this precarity. The primary source of startup capital is overwhelmingly Own source funding, utilized by 64.47% of the entrepreneurs. This heavy reliance on personal savings and internal capital means that the war's systematic destruction did not just eliminate physical production assets, but critically eroded the private financial base required for self-recovery. In the aftermath of massive asset loss, these firms lack the necessary internal equity or formal credit history to rapidly secure the concessional financing needed to replace capital-intensive machinery and replenish inventories, severely constraining the entire sector's ability to restart and contribute to regional economic recovery Figure 15(c).

Damage to Productive Sector Assets and infrastructures by type

Regarding property damage, a total damage of US\$13,861.31 million is registered in the assessed private service sector firms so far because of the war. The following sections details the property damage assessments results.

As stated in the Table 150 above, In the service sector, building damage constitutes the overwhelming majority of the total reported losses, accounting for 68.42% or US\$9,483.88 million out of the aggregate US\$13,861.31million in damage value. This underscores the critical vulnerability of physical infrastructure to disruptions in service-oriented businesses. Consumable and finished goods follow as the second-largest category of loss at 14.90% (US\$2,065.58 million), reflecting the perishable or inventory-dependent nature of many service operations. Electronic equipment represents 7.67% (US\$1,062.72 million), highlighting the sector's reliance on technology, while office furniture accounts for 5.03% (US\$697.48 million).

Table 150: Damage of Items by damage Value (US\$ in millions)

Item Categories	Damage Value (US\$ in Millions)	Share (%)
Building	9,483.88	68.42
Vehicle	74.45	0.54
Fixed/permanent/durable asset	464.54	3.35
Office furniture	697.48	5.03
Electronic equipment	1,062.72	7.67
ICT Items	1.13	0.01
Goods in transit/shipment	4.80	0.03
Consumable & finished goods	2,065.58	14.90
Chemicals	0.80	0.01
Waste disposal	5.93	0.04
Total	13,861.31	100.00

Source: CITG Survey, 2022 and 2023

Other asset categories experienced relatively minor damage. Fixed, permanent, or durable assets comprised 3.35% (US\$464.54Million), and vehicles a negligible 0.54% (US\$74.45 million). Goods in transit or shipment, waste disposal, chemicals, and ICT items each contributed less than 0.05% to the total, with values of US\$4.80 million, US\$5.93 million, US\$0.80 million, and US\$1.13 million, respectively. These figures from the CITG Survey (2022 and 2023) reveal a clear hierarchy of damage impact, with structural and operational essentials bearing the brunt of losses in the service sector

Damage to Building and Building Parts

Means of Damage

According to Table 151, the primary mechanism of building destruction in the service sector was fire and looting, responsible for 86.54% of the total damage value, amounting to US\$8,207.80 million. This points to widespread arson and plundering as the dominant destructive forces. Heavy artillery bombardment ranks second, causing 6.46% (US\$612.54 million) of the damage. Bullet damage accounts for 4.96% (US\$470.42 million), followed by theft at 1.91% (US\$181.50 million). Air strikes and robbery contributed minimally, at 0.07% (US\$6.83 million) and 0.05% (US\$4.78 million), respectively. The overwhelming prevalence of fire and looting underscores deliberate and systematic targeting of physical infrastructure through incendiary and opportunistic means.

Table 151: Damage to Building by Means of Damage (US\$ in Millions)

Means of Damage	Quantity	Total Damage	Share
Air Strike	14,738.00	6.83	0.07
Bullet	10,536.00	470.42	4.96
Fire/Looting	14,940.00	8,207.80	86.54
Heavy Artillery	12,146.00	612.54	6.46
Robbery	1,680.00	4.78	0.05
Theft	102,376.00	181.50	1.91
Grand Total		9,483.88	100

Source: CITG Survey, 2022 and 2023

Damage Severity Level

The severity of building damage in the productive service sector, as detailed in Table 152 from the CITG Survey 2022, shows that complete damage dominates, affecting structures valued at US\$5,169.12 million and representing 54.50% of the total building damage of US\$9,483.88 million. This indicates that over half of the damaged buildings were entirely destroyed. Moderate damage (26–50% destruction) follows, with 3,691.71 buildings damaged at a cost of US\$3,691.71 million, accounting for 38.93% of the total value. Severe damage constitutes

6.28% (US\$595.27 million), while minor damage is negligible at 0.06% (US\$0.06 million). These figures highlight the catastrophic scale of destruction, with nearly 93.43% of the total damage value stemming from moderate to complete destruction.

Table 152: Damage to Building by Damage Severity Level (US\$ in Millions)

Level of Damage	Quantity	Damage Value (US\$ in Millions)	Share (%)
Minor Damage	9014	27.78	0.06
Moderate Damage	7112	3,691.71	38.93
Sever Damage	8464	595.27	6.28
Complete Damage	138258	5,169.12	54.5
Grand Total		9,483.88	100

Source: CITG Survey, 2022 and 2023

Damage by Perpetrators

Error! Not a valid bookmark self-reference. from the CITG Survey 2022 identifies the Ethiopian National Defense Force (ENDF) as the primary perpetrator of building damage in the service sector, responsible for 89.02% of the total damage value, equating to US\$8,442.22 million. This indicates that state military forces were the leading actors in the destruction. The Eritrean Federal Police (EFP) follow distantly with 5.60% (US\$530.98 million), while the Interim Regional Forces (IRF) account for 2.19% (US\$207.35 million). Regional defense forces EDF, AMF, and AFF contributed smaller shares of 1.62% (US\$153.39 million), 1.01% (US\$95.58 million), and 0.57% (US\$54.36 million), respectively. The data clearly establishes the ENDF as the predominant agent of infrastructure destruction in the surveyed service sector firms.

Table 153: Damage to building by Perpetrators (US\$ in Millions)

Perpetrators	Quantity Damaged	Damage Value (US\$ in Millions)	Share
AFF	1,468.00	54.36	0.57
AMF	24,806.00	95.58	1.01
EDF	38,548.00	153.39	1.62
ENDF	94,542.00	8,442.22	89.02
EFP	6.00	530.98	5.6
IRF	3,478.00	207.35	2.19
Grand Total		9,483.88	100

Source: CITG Survey, 2022 and 2023

Damage to Vehicle and Vehicle Parts

Damage type

Table 154 reveals that vehicles and vehicle parts in Tigray's industrial ecosystem suffered US\$ 74.45 million in total damage, with looting emerging as the dominant mechanism at US\$42.63 million (57.26%), affecting 1,476 units and reflecting systematic, high-value asset stripping of

engines, electronics, tires, and components for resale or cross-border transfer. Breakage, valued at US\$29.49 million (39.61%) and impacting 294 units, points to deliberate sabotage—shattered windshields, slashed tires, and dismantled drivetrains—designed to immobilize transport and deny future utility. Burning, though less common at US\$2.33 million (3.13%) and involving 147 units, served as a final act of total destruction, eliminating salvage potential and symbolizing irreversible loss. Together, 96.87% of the damage stemmed from looting and breakage, exposing a calculated dual strategy: extract economic value first, then ensure permanent operational paralysis. This devastation severed critical supply chains, blocked raw material inflows and product outflows, and crippled managerial mobility leaving factories functionally isolated even if physically intact. With parts scarce under ongoing blockade, replacement costs soar amid inflated black-market prices, while the absence of secure logistics and insurance mechanisms prolongs paralysis; full recovery demands not just capital but restored transport security and regional stability to prevent recurrence.

Table 154: Damage to Vehicles and vehicle Parts by Damage type (US\$ in millions)

Damage type	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Broken	294.00	29.49	39.61
Burned	147.00	2.33	3.13
Looted	1,476.00	42.63	57.26
Grand Total		74.45	100.00

Source: CITG Survey, 2022 and 2023

Damage Severity level

Table 155 disaggregates the US\$74.45 million in vehicle and vehicle-parts damage by severity, exposing a bimodal pattern of destruction that combines widespread partial impairment with targeted total loss. Minor damage dominates at US\$59.68 million (49.06%) across 966 units, indicating pervasive but repairable harm dented panels, broken windows, or looted interiors that keeps vehicles off roads due to parts shortages and inflated repair costs under blockade conditions. Missing cases, at US\$0.52 million (0.69%) for 584 units, reflect vehicles unaccounted for after looting raids, likely transported intact across borders or repurposed by perpetrators. Moderate (US\$2.91 million, 3.9%) and severe damage (US\$3.36 million, 4.51%) affect 139 units combined, representing assets requiring major mechanical overhaul—engine failure, chassis warping, or electrical burnout pushing repair beyond economic viability for most micro-enterprises. Complete damage, at US\$7.97 million (10.71%) across 233 units, confirms total write-offs burned-out shells, crushed frames, or systematically dismantled hulks—deliberately rendered irreparable to eliminate future utility. This severity profile reveals a strategic gradient: mass immobilization through minor damage to paralyze daily operations,

selective obliteration of high-value units to erase capital stock, and wholesale disappearance to transfer wealth. With nearly 50% of losses in the minor category, the sector faces a repair trap technically fixable but financially and logistically impossible while 15.22% in severe/complete tiers demands full fleet replacement. Recovery hinges on prioritizing minor repairs with subsidized parts and mobile mechanics, insuring against missing assets, and securing salvageable wrecks; without such triage, even surviving firms remain grounded in a transport desert.

Table 155: Damage to Vehicles and vehicle Parts by Damage Severity Level (US\$ in millions)

Damage Severity Level	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Missing cases	584	0.52	0.69
Minor Damage	966	59.68	49.06
Moderate damage	70	2.91	3.9
Sever Damage	69	3.36	4.51
Complete Damage	233	7.97	10.71
Total		74.45	100

Source: CITG Survey, 2022 and 2023

Damage by Perpetrators

The data reveals that vehicle damage across service firms was overwhelmingly caused by state military actors, with the Ethiopian National Defense Forces (ENDF) responsible for the vast majority. The total damage to vehicles is estimated at US\$ 74.45 million U, with a notable number of cases still unaccounted for due to missing data.

ENDF accounts for 76.9% of total vehicle damage, indicating widespread and systematic destruction likely tied to military operations or strategic targeting of transport assets. EDF (Eritrean Defence Forces) is responsible for 18.13%, reflecting cross-border involvement and coordinated campaigns affecting mobility infrastructure. Amhara Forces contributed 4.37%, suggesting localized or regional engagements with targeted vehicle damage. Federal Police, while involved in only 19 cases, caused 0.59% of the damage which is likely linked to seizures or enforcement actions.

Table 156: Damage to Vehicles and vehicle Parts by perpetrators (US\$ in millions)

Perpetrators	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
AMF	116	3.26	4.37
EDF	285	13.50	18.13
ENDF	941	57.25	76.90
EFP	19	0.44	0.59
Total		74.45	100.00

Source: CITG Survey, 2022 and 2023

Damage to Electronic and Electrical Equipment

Damage by Type

Table 157 Shows that US\$1,060.84 million in total damage to electrical equipment across Tigray's service sectors, with burning as the overwhelmingly dominant mechanism at US\$733.50 million (69.14%), affecting 2,556 units. This reflects systematic arson—torched server rooms, incinerated control panels, and melted wiring designed to erase digital infrastructure and render facilities inoperable. Breakage follows at US\$144.07 million (13.58%) across 198 units, indicating deliberate sabotage such as smashed monitors, shattered circuit boards, and forcibly dismantled generators. Looting accounts for US\$98.15 million (9.25%) over 315 units, targeting portable high-value items laptops, routers, and backup batteries stripped for resale or military repurposing. Destruction (distinct from burning/breakage) contributes US\$81.26 million (7.66%) across 172 units, involving crushing, dismantling, or explosive disabling of critical systems. Missing cases unclassified damage total US\$3.87 million (0.36%) for 172 units, likely underreported due to lost documentation. The 82.72% dominance of burning and breakage confirms a scorched-earth digital strategy: obliterate first, loot what survives.

Table 157: Damage to Electronic and Electrical Equipment by Damage type (US\$ in Millions)

Damage type	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Missing Cases ¹⁵	172.00	3.87	0.36
Broken	198.00	144.07	13.58
Burnt	2,556.00	733.50	69.14
Destroyed	172.00	81.26	7.66
Looted	315.00	98.15	9.25
Grand Total		1,060.84	100.00

Source: CITG Survey, 2022 and 2023

Damage Severity Level

Table 158 reveals a near-apocalyptic severity profile, with US\$1,062.72 million in total damage 92.11% (US\$978.87 million) classified as complete destruction across 3,204 units. This means over three thousand electronic assets servers, switches, industrial controllers, and communication devices were rendered 100% non-functional and unrepairable, effectively erasing institutional memory, automation capacity, and connectivity. Severe damage (51–75%) affects 81 units at US\$83.36 million (7.84%), representing systems partially operable but economically irreparable due to specialized components and blockade-induced scarcity.

¹⁵ "Missing Case" refers to a scenario where the respondent did not indicate the type of damage experienced.

Moderate (US\$0.08 million, 0.01%) and minor damage (US\$0.41 million, 0.04%) are negligible covering just 84 units indicating almost no middle ground: electronics either survived intact or were completely annihilated. Only 26 units (0.03%) remained undamaged. This 92% complete-loss threshold signals targeted technological genocide, where the goal was not disruption but permanent digital dispossession.

Table 158. Damage to Electronic and Electrical Equipment by Damage Severity Level (US\$ in Millions)

Level of Damage	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Minor Damage	45	0.41	0.04
Moderate Damage	39	0.08	0.01
Sever Damage	81	83.36	7.84
Complete Damage	3204	978.87	92.11
Total		1,062.72	100.00

Source: CITG Survey, 2022 and 2023

Damage by Perpetrators

Table 159 attributes the US\$1,062.72 million devastation to a multi-actor assault, with IRF (Illegal Armed Groups) leading at US\$322.23 million (30.32%) across 182 incidents, exploiting chaos to loot and torch high-value electronics during lawless sweeps. Afar Forces (AFF) follow closely with US\$309.99 million (29.17%), indicating regional military campaigns that systematically targeted service-sector infrastructure power stations, telecom hubs, and factory automation. Eritrean Defense Forces (EDF) inflicted US\$248.32 million (23.37%) over 1,545 units, confirming cross-border technical sabotage—dismantling servers, burning data centers, and extracting components for military reuse. Ethiopian National Defense Forces (ENDF) caused US\$181.27 million (17.06%) across 1,141 incidents, blending collateral bombardment with targeted strikes on control rooms and backup systems. Amhara Forces (AMF) and Federal Police (EFP) had negligible impact.

Table 159: Damage to Electronic and Electrical Equipment by Perpetrators (US\$ in Millions)

Perpetrators	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Missing Cases	45	-	-
AFF	108	309.99	29.17
AMF	389	0.91	0.09
EDF	1545	248.32	23.37
ENDF	1141	181.27	17.06
EFP	3	0.00	0.00
IRF	182	322.23	30.32
Total		1,062.72	100.00

Source: CITG Survey, 2022 and 2023

Damage Durable Goods

Damage type

The vast majority of the financial damage is attributed to two specific types of actions: Looted and Burnt goods (Table 160). Looting accounts for the single largest financial loss at US\$ 251.78 Million (54.20%), closely followed by damage from burning, valued at US\$ 199.05 Million (42.85%). This indicates that over 97% of the total financial loss is a direct result of either theft (looting) or fire damage. Damage categorized as Broken (2.39%) and Destroyed (0.54%) are financially negligible in comparison.

Table 160: Means of Committing the Damage on the Durable Goods

Damage Type	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Broken	4.00	11.13	2.39
Burnt	25.00	199.05	42.85
Destroyed	1.00	2.52	0.54
Looted	89612.70	251.78	54.20
Other		0.06	0.01
Total		464.54	100.00

Source: CITG Survey, 2022 and 2023

Damage Severity Level

Table 161 shows a high concentration of destruction within Tigray's service sector's durable goods. Out of the total estimated damage of US\$ 464.54 million, an overwhelming 97.35% is due to complete destruction, impacting more than 89,641 durable assets. This pattern indicates targeted and extensive damage to productive assets, resulting in near-total loss and the need for full replacement. The small percentage of partially salvageable goods emphasizes the severity and irreversibility of the destruction inflicted.

Table 161. Damage to Durable Goods by Damage Severity Level(US\$ in Millions)

Damage Severity Level	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Minor damage	1	1.27	0.27
Complete damage	89641.7	463.27	97.35
Grand Total		464.54	100

Source: CITG Survey, 2022 and 2023

Damage by Perpetrators

As can be depicted in the Table 162, the two main groups identified as perpetrators are the ENDF (Ethiopian National Defense Force) and the EDF (Eritrean Defense Force), who are responsible for the vast majority of the damage value. The ENDF accounts for the largest share at US\$ 257.56 Million (55.44%), followed by the EDF at US\$ 165.59 Million (35.65%).

Together, these two forces are attributed over 91% of the total damage. The remaining groups contribute relatively small percentages to the overall damage value

Table 162: Damage to Durable Goods by Perpetrators (US\$ in Millions)

Perpetrators	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
ENDF	257.56	55.44	ENDF
EDF	165.59	35.65	EDF
AMF	30.78	6.63	AMF
IRF	9.97	2.15	IRF
AFF	0.32	0.07	AFF
Others	0.28	0.06	Others
EFP	0.04	0.01	EFP
Total	464.54	100.00	Total

Source: CITG Survey, 2022 and 2023

Damage to Goods in Transit

This section details the damage to Goods in Transportation and Transit by identifying the executors and the scale of the damage, referencing Table 163 from the CITG Survey (2022 and 2023). The total damage value reported for goods in transportation and transit is US\$4.80 million.

Damage Perpetrators

Table 163. Damage to Goods in Transport and Transit by Perpetrators (US\$ in Million)

Perpetrators	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
ENDF	22,655.00	3.73	77.80
AMF	526,328.00	0.54	11.20
IRF	1,548,728.00	0.49	10.27
Unspecified	1,001.00	0.02	0.46
EFP	203.00	0.01	0.28
Total		4.80	100.00

Table 163 clearly indicates that the Ethiopian National Defense Forces (ENDF) are responsible for the vast majority of the damage value, accounting for US\$3.73 million, which is 77.80% of the total loss. The next two significant contributors are the Amhara Forces (AMF), with 11.20% (US\$0.54 Million), and the Irregular Forces (IRF) (likely Gangsters, based on the previous table's context) with 10.27% (US\$0.49 Million). Together, these three groups, ENDF, AMF, and IRF, account for over 99% of the total monetary damage. It is worth noting that while the Irregular Forces (IRF) were responsible for the largest Damaged Quantity (1,548,728 units), the Ethiopian National Defense Forces (ENDF) inflicted the highest monetary value of damage, suggesting that the goods damaged by the ENDF were significantly more valuable per unit than those damaged by other groups.

Damage to Chemicals

This section interprets the damage to Chemicals based on the damage type and the perpetrators, according to the CITG Survey from 2022 and 2023. The total reported damage value for chemicals across both tables is US\$0.80 million.

Damage Type

As to Table 164, Burning accounts for 85% of the total damage, affecting nearly 28 million units. This suggests widespread fire-related destruction, possibly due to arson, collateral damage during attacks, or unsafe storage conditions. Missing cases represent 8.81%, indicating significant gaps in documentation or inaccessible sites critical for accountability and inventory reconciliation.

Other forms of damage (4.76%) may include chemical spills, contamination, or improper disposal, which still pose environmental and operational risks. Looting and deliberate destruction, while financially minor, reflect targeted efforts to remove or disable chemical assets potentially hazardous if involving industrial or medical-grade substances.

Table 164: Damage/Execution Type on Chemicals

Perpetrator	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Missing Cases	14,504.00	0.07	8.81
Burnt	27,980,548.00	0.68	85.00
Destroyed	215,996.00	0.01	0.80
Looted	15,087.00	0.01	0.63
Other	1,203.00	0.04	4.76
Grand Total		0.80	100.00

Source: CITG Survey, 2022 and 2023

Damage by Perpetrators

The Amhara Forces (AMF) are the leading attributed perpetrators, responsible for US\$ 0.36 Million, or 45.16% of the total chemical damage (Table 165). This signifies major regional military activity impacting chemical inventories.

The Unspecified perpetrator category is very high, at 31.34% (US\$ 0.25 Million), which is the second-largest share. This significant gap in attribution is crucial, possibly masking the true extent of damage caused by various parties. The Eritrean Defense Force (EDF) follows with 12.14% (US\$ 0.10 Million), and Irregular Forces (IRF) account for 6.90% (US\$ 0.06 Million). The Ethiopian National Defense Forces (ENDF) and the Federal Police (EFP) played only a minor role in the documented damage value.

Table 165: Perpetrators of Damage to Chemicals

Perpetrator	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Unspecified	234,114.00	0.25	31.34
AMF	5,903,188.00	0.36	45.16
EDF	22,088,208.00	0.10	12.14
ENDF	679.00	0.04	4.45
EFP	15.00	0.00	0.00
IRF	1,134.00	0.06	6.90
Grand Total		0.80	100.00

Source: CITG Survey, 2022 and 2023

Damage to Consumable Goods

Damage type

Looting is the dominant damage type, accounting for 84.48% of the total loss (Table 166). This reflects widespread and systematic stripping of consumable inventories—likely during periods of lawlessness, occupation, or forced displacement. Theft, while less organized than looting, still contributes 3.64%, suggesting opportunistic or small-scale asset loss. Missing cases represent 11.79% of the damage, indicating significant gaps in documentation, response rates, or unverified losses. Artillery and bullet-related damage, though minimal in financial terms, may reflect destruction during armed engagements or targeted attacks on storage facilities.

Table 166: Damage Type on Consumable Goods

Type of damage	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Bullet	3,255.00	0.72	0.04
Ground artillery bombardments	3,258,140.00	1.11	0.05
Looting	20,185,084.78	1,745.02	84.48
Theft	5,833,140.00	75.13	3.64
Missing cases	45,148.00	243.59	11.79
Grand Total		2,065.58	100.00

Source: CITG Survey, 2022 and 2023

Damage Severity Level

The severity level analysis reinforces the scale of loss. Nearly all the damage, 99.73% (US\$ 2,060.06 Million), is categorized as Complete Damage. Given the primary means of damage is Looting, "Complete Damage" in this context mostly signifies the total loss of the goods through removal rather than destruction in place. Minor, Moderate, and Severe Damage categories combined account for less than 0.3% of the total value (Table 167).

Table 167. Level of damage to the Building

Damage Severity Level	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Minor Damage	20	1.26	0.06
Moderate Damage	18	0.13	0.01
Sever Damage	2,237.00	4.13	0.20
Complete Damage	29,322,432.78	2,060.06	99.73
Total		2,065.58	100.00

Source: CITG Survey, 2022 and 2023

Damage by Perpetrator

The data assigns overwhelming responsibility for the damage to the Irregular Forces (IRF). This group is attributed US\$ 2,063.57 Million, or 99.90% of the total consumable goods damage value. This massive concentration of value under the IRF contrasts sharply with their smaller shares in previous damage categories and is highly correlated with the dominant "Looted" damage type.

All other identified forces, including the EDF, ENDF, and AMF, as well as the combined "ENDF and EDF" and "Unspecified Case" categories, are responsible for only 0.10% of the damage value, which is effectively negligible in comparison to the IRF's contribution (Table 168).

Table 168. Executors of damage on consumables

Perpetrators	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Unspecified Cases	4,088.00	0.01	0.00
ENDF and EDF	7,359.00	0.05	0.00
EDF	380,318.00	1.88	0.09
ENDF	1,635.00	0.07	0.00
AMF	10.00	0.00	0.00
IRF	28,931,357.78	2,063.57	99.90
Total		2,065.58	100.00

Source: CITG Survey, 2022 and 2023

Damage to Waste Disposal Equipment

This section interprets the damage to Waste Disposal facilities and assets based on the damage type, referencing Table 169**Error! Reference source not found.** from the CITG Survey. The total reported damage value for waste disposal is US\$ 5.93 Million.

The data shows that Burning is the dominant cause of damage to waste disposal assets, accounting for US\$ 5.60 Million, which is an overwhelming 94.45% of the total damage value. This suggests that the destruction of waste disposal infrastructure primarily occurred through fire, possibly impacting machinery, storage facilities, or material processing sites. The Other category is the second-largest contributor at 4.48% (US\$ 0.27 Million), which may encompass various forms of operational failure, chemical spills, or contamination not covered by the main

categories. Looting and Destroyed damage types account for minimal portions of the financial loss, at 1.01% and 0.06% respectively.

The high proportion of Burnt damage highlights a significant environmental and public health risk, as the destruction of waste disposal sites can lead to the uncontrolled release of hazardous materials and the cessation of essential sanitation services.

Table 169: Damage Type on Waste Disposal

Damage type	Damaged Quantity	Damage Value (US\$ in Millions)	Share (%)
Burnt	4,338.00	5.60	94.45
Other	380.00	0.27	4.48
Looted	181.00	0.06	1.01
Destroyed	43.00	0.00	0.06
Total	4,942.00	5.93	100.00

Source: CITG Survey, 2022 and 2023

Loss by category

The assessed private service sector firms in Tigray recorded an acute financial toll between 2020 and 2023 due to the war and subsequent siege. This impact is analyzed across two primary categories: revenue losses and additional costs incurred (Table 170).

Table 170. Loss Value to Productive Service Sector (US\$ in Millions)

Loss Category	Item Description	Value (US\$ Millions)	Share (%)
Revenue Losses			
Loss (2021)	Revenue Loss for the year 2021	265.49	
Loss (2022)	Revenue Loss for the year 2022	272.57	
Loss (2023)	Revenue Loss for the year 2023	16.11	
Total Revenue Loss (2021-2023)	Total direct loss in sales revenue	554.16	6.95
Additional Costs			
Increased purchase cost	Due to increase in price (Inflation/Supply Chain)	2,460.18	
Rental cost		4.57	
Other costs		3.66	
Maintenance Cost		1.76	
Total Additional Cost Incurred	Total operational expenses incurred due to war/siege	2,470.17	31.00
Forgone Value			
Forgone Value	Opportunities lost/Value that could have been created	4,943.57	62.04
Grand Total Loss		7,967.90	100.00

Source: CITG Survey ,2022 and 2023

Revenue Losses from Service Production

As indicated Table 170 the total revenue loss recorded across the assessed private service sector firms over the three-year period (2021-2023) is US\$ 554.16 million. This loss is calculated

against an average annual sales figure of US\$ 1,357.65 million from the pre-war years (2018, 2019, and 2020).

The most severe revenue losses occurred in the initial years of the conflict and siege. The year 2022 recorded the highest loss at US\$ 272.57 million, closely followed by 2021 with a loss of US\$ 265.49 million. The combined losses for these two years account for the vast majority of the total financial damage. In contrast, the loss recorded in 2023 was significantly smaller at US\$ 16.11 million, suggesting that either operations began to recover slightly or that the most affected businesses had already suffered their maximum loss and ceased operations. The overall revenue loss of US\$ 554.16 million represents a substantial portion of the sector's average three-year sales, highlighting the crippling effect of the conflict on service production.

Additional Costs and Forgone Value

Beyond direct revenue loss, the private service sector firms registered significant additional expenses and forgone value totaling US\$ 2,470.17 million (Table 170).

The dominant component of the additional cost is the increased purchase cost due to increase in price, amounting to an immense US\$ 2,460.18 million. This figure alone makes up virtually the entire additional cost incurred, demonstrating that severe inflation, supply chain disruptions, and market instability were the most detrimental factors driving up operational expenses.

Other identified additional costs were minor in comparison: Rental cost was US\$ 4.57 million, Other costs totaled US\$ 3.66 million, and Maintenance Cost was US\$ 1.76 million.

Furthermore, the data includes a separate metric for Forgone Value, which is reported as US\$ 4,943.57 million. This figure, which is nearly double the total additional cost, represents opportunities lost or value that could have been created had the firms operated normally. This massive forgone value, combined with the US\$ 554.16 million in revenue loss and the US\$ 2,470.17 million in additional costs, illustrates the comprehensive and profound devastation inflicted upon the service sector's economic capacity.

Impact of the war

The provided data, covering the pre-war period versus the 2021 to 2022 conflict period, details the catastrophic decline in key economic and labor indicators for the service sector. The figures clearly illustrate the near-total collapse of international engagement, investment, and significant loss of employment due to the war and siege.

Collapse of External Economic Activity

The impact on foreign-related economic indicators was nearly absolute. As stated in Table 171, Foreign Currency generation saw the most dramatic drop, plummeting from a pre-war value of US\$ 148.00 million to a mere US\$ 0.02 million during the conflict period, resulting in a difference (loss) of US\$ 147.98 million. Similarly, Foreign Investment effectively vanished, declining from US\$ 7.66 million pre-war to US\$ 0.01 million during the war, representing a loss of US\$ 7.66 million. Export revenues also suffered a major blow, dropping from US\$3.34 million to US\$0.35 million, leading to a loss of US\$2.99 million. These figures collectively demonstrate a complete and near-total disruption of the service sector's ability to engage internationally.

Table 171. Impact of the war on Productive Service sector (US\$ in Millions)

Categories	Prewar (2020)	(2021 to 2022)	Difference
Export (US\$ in Million)	3.34	0.35	2.99
Foreign Currency (US\$ in Million)	148.00	0.02	147.98
Federal Tax (US\$ in Million)	0.47	0.14	0.33
Regional Tax (US\$ in Million)	2.76	0.07	2.70
Foreign Investment (US\$ in Million)	7.66	0.01	7.66
Domestic Investment (US\$ in Million)	111.86	0.15	111.71
Employment (Number of Employees)	102,962	11,811.00	91,151.00
Professional Employee damaged (Number)		3,654	

Source: CITG Survey, 2022 and 2023

Devastation of Investment and Tax Revenue

Table 171 shows that the decline in domestic economic activity was equally severe. Domestic Investment saw a massive drop from a pre-war figure of US\$ 111.86 million to only US\$ 0.15 million during the conflict, signifying a huge loss of US\$ 111.71 million. This near cessation of domestic investment points to extreme economic uncertainty, widespread destruction of assets, and the inability of local businesses to raise or commit capital. Tax revenues, which are crucial for governmental operations, were also significantly impacted. Regional Tax collection fell from US\$ 2.76 million to US\$ 0.07 million, a loss of US\$ 2.70 million. Federal Tax collection declined from US\$ 0.47 million to US\$ 0.14 million, a loss of US\$ 0.33 million. These major reductions in the tax base reflect the widespread operational shutdowns and severe revenue losses across the service sector.

Employment and Human Capital Loss

As depicted in Table 171 the human cost is reflected in the dramatic drop in employment. The total Employment (Number of Employees) in the assessed service sectors fell from 102,962 pre-war to only 11,811 during the 2021-2022 period, marking a massive reduction of 91,151 employees. This represents a near 90% collapse in the sector's workforce, suggesting massive displacement, mobilization, or the permanent closure of businesses. Furthermore, the data specifically highlights the direct loss of skilled personnel, reporting that 3,654 Professional Employees were damaged (likely indicating injury, death, or permanent loss from the workforce). This profound loss of professional human capital is a major barrier to the future recovery of the service sector, compounding the difficulties presented by the loss of financial assets and investment.

Current Status of Firm Functionality Post-War and Siege

The data clearly indicates that the war and siege severely impaired the operational capacity of the surveyed firms, with the vast majority operating at very low functionality levels. The survey assessed 12,816 firms in total.

The most critical finding is that 71.79% of the firms (9,201 firms) are currently functioning at a level of 0-25 percent. This overwhelming majority suggests that most businesses are either completely shut down or are barely operating, highlighting the widespread devastation and economic paralysis across the sector.

Only a small fraction of firms is maintaining moderate or high levels of operation:

- Low Functionality (26-50 percent): 11.91% of firms (1,527 firms) fall into this category, meaning that even beyond the most impacted group, a significant portion is still operating at less than half capacity.
- Moderate Functionality (51-75 percent): A very small segment, only 4.07% of firms (521 firms), maintains over half their normal operational level.
- High Functionality (76-100 percent): 12.23% of firms (1,567 firms) report near-normal to full operational status. This segment likely represents businesses that were less reliant on damaged infrastructure, supply chains, or those that managed to recover quickly.

2.4.3 Conclusion and Recommendation

Conclusion

The findings of the Damage and Loss Assessment (DaLA) reveal that the total war, siege, and blockade in Tigray have inflicted a deliberate and catastrophic level of destruction upon the productive private service sector. This sector, which was a leading force in the regional economy with an average pre-war growth rate of 9.94%, has been systemically dismantled. The economic destruction was intentional, as evidenced by the near-absolute collapse of key macroeconomic indicators and the operational shutdown of the majority of firms. The overall total damage value registered from the surveyed firms stands at a staggering US\$ 13.86 billion.

The combined financial impact extends far beyond physical damage. The firms recorded a direct Loss value of US\$ 554,159,292.04, supplemented by US\$ 2,470,169,911.50 in additional costs, primarily driven by crippling increases in purchase prices. The potential economic output that was foregone is nearly double the direct losses and additional costs combined, with a Forgone value of US\$ 4.94billion. Moreover, the sector is burdened by unpaid debt and a massive unpaid salary and allowance obligation, indicating a profound liquidity crisis and social hardship

Operationally and structurally, the sector has been brought to a halt. A crushing 70.3% of the assessed firms were found to be functioning at an almost total destruction level (0-25% functional). This operational collapse is directly correlated with a devastating loss of human capital: the workforce plunged from 102,962 employees pre-war to just 11,811 post-war, representing a reduction of 91,151 employees. Compounding this is the confirmed loss of 3,654 employees due to death, disability, or disappearance. The war also shattered external engagement, with Foreign Currency generation plummeting by US\$ 147.98 million and Foreign Direct Investment (FDI) decreasing by US\$ 7.66 million, fundamentally reversing Tigray's image as a secured investment destination. The magnitude and nature of these damages necessitate an immediate, multi-phased, and highly strategic approach to recovery.

Recommendation

To facilitate a faster and more resilient recovery of the private service sector, a comprehensive roadmap must be executed with immediate, intermediate, and long-term interventions. These recommendations focus on financial restructuring, institutional resilience, and market confidence rebuilding.

Financial Stabilization and Investment Mobilization

The immediate priority must be to inject liquidity and restructure the crippling debt burden. This requires:

- **Incentive Packages and Debt Relief:** Deploying appropriate financial incentive packages, including tax holidays, subsidized credit lines, and grants, particularly for micro and small enterprises (which constitute 85.67% of the assessed firms).
- **Empowering Domestic Investment:** Given the collapse of FDI, efforts should prioritize empowering and guaranteeing domestic Investment through special funds and public-private partnership initiatives to replace the lost US\$ 111.71 million in pre-war domestic investment and foster local capital commitment.

Operational Resilience and Institutional Capacity

Rebuilding the sector requires modernizing institutional frameworks and establishing protective measures against future shocks:

- **Crisis and Disaster Management:** Develop and implement a robust, sector-specific crisis and disaster management plan to rapidly assess, mitigate, and respond to future disruptions, integrating lessons learned from the recent siege and blockade.
- **Technological Adoption and Diversification:** Encourage firms to adapt and introduce different technologies to enhance operational efficiency and security. Concurrently, support programs should be established to help firms diversify businesses by focusing on Tigray's unique selling propositions, moving away from sectors that proved highly vulnerable to war.
- **Security and Legal Tightening:** Immediate efforts must focus on tightening security across the region to protect remaining assets and ensure the safety of employees and

customers. Furthermore, legal and institutional frameworks must be strengthened to address the perpetrators and accountability for the deliberate economic destruction.

Human Capital and Market Confidence Restoration

The massive loss of employment and skilled professionals poses a significant long-term threat that must be addressed through targeted development and market re-engagement:

- **Human Resource Development:** Initiate massive-scale human resource development and vocational training programs to re-skill the 91,151 unemployed workers and replace the capacity lost due to the 3,654 "damaged" professional employees. This must include trauma support and reintegration programs.
- **Aggressive Marketing and Image Restoration:** Launch an aggressive marketing and public relations campaign to counter the adverse advisories and spoiled image of Tigray as an investment and service destination. This campaign must focus on rebuilding and winning the confidence of domestic and international stakeholders, particularly within the tourism and logistics sub-sectors.
- **Payment of Outstanding Wages:** An urgent fund must be established to address the massive US\$ 1.31 billion in Unpaid Salary and allowance, which is a critical step in restoring social trust and economic stability for the workforce.

2.5 Damage and Loss to Trade

2.5.1 Introduction

The Tigray region had been steadily progressing on its overall development path prior to the war in Tigray. Particularly in the trade sector, the region experienced notable growth that significantly contributed to the macro economy through GDP growth, tax revenues, and job creation. Firms engaged in goods and service delivery were thriving, employing a large workforce and playing a critical role in economic activities. However, this progress has been severely disrupted due to the war and siege. Both national and international trade routes have been blocked, leading to a complete halt in the exchange of goods. This blockade has not only stifled commerce but has also undermined the livelihoods of many, as market access collapsed and economic activities ground to a standstill, reversing years of economic gains and development in the region.

The trade sector was undergoing a significant transformation, modernizing the traditional trading practices of both the country and the region. This modernization process contributed substantially to employment creation, expanded export activities, and became an important source of foreign currency generation. The sector played a crucial role in integrating the regional economy into broader national and international markets, supporting sustainable economic growth and improving livelihoods.

The trade sector in the Tigray region has played a vital role in driving both regional and national macroeconomic progress. In 2012 E.C., it created numerous employment opportunities and generated substantial tax revenue for both the regional and federal governments. For instance, data from surveyed firms in that year revealed that exports amounted to approximately US\$7.95 billion, while tax revenues totalled US\$18,678,031, with US\$9,011,491 allocated to the regional government and US\$9,666,540 to the federal government. Although these figures represent only a portion of the sector (taking only firms included in the survey), they underscore the robustness and significant contribution of the trade sector to the economic growth and development of Tigray and Ethiopia as a whole

2.5.2 Results

Respondent Profile

The profile of firms includes their distribution across zones within the Tigray region, the formation of firms, their size, and their post-working capacity. As per the zonal distribution, the assessment covered 2,9807 private firms across seven zones. The largest share of data was collected from Eastern (35.17%), followed by Central (20.96%) and South (11.12%) zones (Table 172). This distribution reflects accessibility during data collection—not the zonal intensity (proportion) of damage.

Table 172. Zonal (Geographic Distribution) of affected firms.

Zone	Number of firms	Share (%)
Central	6248	20.96
Eastern	10483	35.17
Mekelle	2611	8.76
North West	2444	8.20
South	3315	11.12
South East	1559	5.23
Western	3147	10.56
Total	29807	100.00

Source: CITG Survey, 2022 & 2023

The Trade sector is structurally dominated by the smallest enterprises, indicating a decentralized, grassroots commercial ecosystem. Sole proprietorships account for an overwhelming 98.9% of all businesses, with other legal forms (Partnership, PLC, Corporation) being negligible. Similarly, the size classification confirms a high reliance on small-scale commerce: Micro-scale businesses represent 93.42% of the respondents. This structural profile means that damage to the Trade sector directly impacts a vast number of individual livelihoods and households (Table 173).

Table 173. Affected Firms by their legal business formation.

Forms of Business	Number of firms	Share (%)
Cooperatives	90	0.28
Corporation	8	0.025
PLC	91	0.28
Partnership	158	0.49
Sole proprietorship	31,286	98.90
Total	31,633	100

Source: CITG Survey, 2022 & 2023

The Trade sector is structurally dominated by the smallest enterprises, indicating a decentralized, grassroots commercial ecosystem. Sole proprietorships account for an overwhelming 98.9% of all businesses, with other legal forms (Partnership, PLC, Corporation)

being negligible. Similarly, the size classification confirms a high reliance on small-scale commerce: Micro-scale businesses represent 93.42% of the respondents. This structural profile means that damage to the Trade sector directly impacts a vast number of individual livelihoods and households (Table 174).

Table 174. Affected business by their levels of Business.

Level of Business	Number of firms	Share (%)
Micro	29550	93.3
Small	1022	3.2
Medium scale	816	2.6
Large-scale	245	0.8
Total	31633	99.9

Source: CITG Survey, 2022 & 2023

The size classification confirms a high reliance on small-scale commerce: Micro-scale businesses represent 93.42% of the respondents. This structural profile means that damage to the Trade sector directly impacts a vast number of individual livelihoods and households (Table 175).

Table 175. Affected Firms by Source of Start-up Capital.

Source	Number of firms	Share (%)
Self-Financing	19,418	59
Loan	6,506	20
Both loan and self-financing	5,858	18
Donation	1,086	3
Total	32,868	100

Source: CITG Survey, 2022 & 2023

The primary source of finance for trade activities is Self-Financing (59%), followed by Loan financing (20%) and Both Loan and Self-Financing (18%), signifying a high degree of entrepreneurial reliance on personal savings and limited dependence on formal credit for initial capital (Table 176).

Table 176. Operational Status of Firms before the War.

Operational status	Number of firms	Share (%)
On operation	29,309	89.17
On progress	2763	8.41
On Test(trial)	796	2.42
Total	32,868	100.00

Source: CITG Survey, 2022 & 2023

The data on current operational status suggests a misleading level of activity. A large majority of firms report being "On Operation" (89.17%), with smaller portions "On Progress" or "On Test." However, this self-reported status is starkly contradicted by the analysis of actual working capacity (Table 177).

Table 177. Current Working Capacity Firms as Compared to Pre-war Capacity.

Current working capacity of firms (as of 2021 and 2022)	Number of firms	Share (%)
0%	16,682	51
(0-25%]	8,470	26
(25-50%]	3,014	9
(50-75%]	1,038	3
(75-100%]	3,664	11
Total	32,868	100

Source: CITG Survey, 2022 & 2023

The most critical finding lies in the gap between reported operational status and actual working capacity when compared to the pre-war baseline. A massive 51% of trade firms report a 0% current working capacity, meaning over half of the commercial enterprises are functionally shut down despite perhaps being physically present. An additional 26% are operating at a minimal capacity of (0-25%]. Cumulatively, 77% of the trade sector is either completely non-functional or operating at negligible levels. This evidence of functional paralysis confirms that the physical destruction and asset stripping observed in the sector have resulted in a near-total collapse of commercial activity, transforming the challenge into one of capital and resource replenishment rather than simple reopening.

Table 178. Employee's status of the affected firms.

Employees	Number
Recruited before the (2012)	73,716
Recruited in 2013 E.C	12,641
Recruited in 2014 E.C	10,619
Killed, injured and missing during the in 2013 E.C	2,683
Killed, injured and missing during the in 2014 E.C	1,796

Source: CITG Survey, 2022 & 2023

There were 10,619 employees in 2014 E.C. As expected, the number of employees has reduced comparing to the previous years as a result of the ongoing though firms seem to struggle to keep their business operations from complete shutdown.

The -related casualties (killings, physical injuries, and disappearance of employees) also show significant human losses. In 2013 E.C alone, 2,683 employees were reported killed, injured, or missing. This equates to a devastating human toll affecting nearly 3.6% of pre- recruitment figures, profoundly impacting labor availability and firm operations. The following year, 2014 E.C, saw further casualties with 1,796 employees killed, injured, or missing. This represents a substantial loss, demonstrating ongoing human costs and workforce disruptions.

Damage to trade by item

As stated in the Table 179 , the Trade sector in the Tigray Regional State sustained an aggregate physical damage value of US\$8.62 billion, with the majority of this economic damage value

concentrated in just three key categories, accounting for over 85% of the total. The single largest component of damage is to Buildings (30.10% or US\$2.60 billion), indicating widespread destruction of core commercial infrastructure such as warehouses, markets, retail spaces, and offices, which represents a fundamental collapse of the sector's physical base. Closely following are the losses of Merchandise Goods (26.94% or US\$2.32 billion) and Imported Goods (in transit) (21.87% or US\$1.89 billion), which together signify a direct assault on the commerce flow by wiping out inventory, business working capital, and critical logistical supplies often stored at regional hubs. Secondary damage is concentrated in Fixed equipment (14.10% or US\$1.22 billion), encompassing essential machinery and specialized logistics systems, while minor categories like vehicles, office furniture, and ICT equipment account for the remainder. The scale and nature of this destruction stance severe long-term implications for the region's recovery: the massive loss in buildings and fixed equipment means the inherent capacity for trade has been physically dismantled, guaranteeing a prolonged reconstruction period. Furthermore, the decimation of merchandise and imported goods represents an immediate loss of business capital, rendering most traders unable to restart operations without significant external financing. Consequently, the destruction ensures a continued disruption of local and regional supply chains, leading to commodity shortages and inflation. Crucially, as this US\$8.62 billion figure only covers the replacement value of destroyed assets (in line with international damage assessment standards like PDNA), the actual financial requirement for the sector's full recovery which must also include economic losses and reconstruction needs will be substantially higher.

Table 179. Damage Value for the Trade sector by Items (US\$ in million)

Damaged asset	Damage value in US\$	Share (%)
Building	2595.96	30.10
Vehicle	91.48	1.06
Fixed equipment	1215.79	14.10
Office Furniture	7.55	0.09
Electrical equipment	41.10	0.48
ICT equipment	8.59	0.10
Imported (Goods in transit)	1885.91	21.87
Consumable and finished goods	404.26	4.69
Dangerous Chemicals	36.81	0.43
Waste disposal equipment	4.33	0.05
Merchandise Goods	2323.02	26.94
Machine and machinery	9.05	0.10
Grand Total	8623.85	100.00

Source: CITG 2022,2023

Damage Value of Buildings and Building Facilities (accessories)

The total damage value of US\$2.60 billion attributed to Buildings in the Trade Sector (as noted in Table 203) is further broken down by the type and severity of damage inflicted upon commercial structures, their parts, and accessories (such as doors and windows).

Damage type

Table 180 reveals that the primary mechanism of destruction was looting, which accounts for US\$1.52 billion, or a dominant 58.45% of the total building damage value. This high proportion is significant, as it suggests a systematic and extensive extraction of valuable fixed assets and resources from trade facilities, which far surpasses the financial impact of structural destruction. While the physical quantity of items affected by Demolition (6.05 million) and Broken components (254,441) is substantial, their collective economic impact is much lower, totalling just 15.19% of the value. The remaining damage is attributed to Combined methods (20.98% or US\$544.76 million) and Burned structures (5.37%). This damage assessment, covering 9,682 commercial buildings, demonstrates that the war did not only involve physical destruction but also a targeted, high-value seizure of assets critical for the sector's operational capacity, presenting a profound challenge for structural and functional recovery.

Table 180. Damage of Building and Building Accessories by damage type (US\$ in Millions)

Damage Type	Quantity of damaged	Damage Value (US\$ in million)	Share%
Broken	254,441	109.49	4.22
Burned	118,275	139.45	5.37
Demolished	6,052,063	284.89	10.97
Looted	20,302,946	1,517.37	58.45
Combined	125,429	544.76	20.98
Total		2,595.96	100

Source: CITG 2022,2023

Means of Damage Execution

The US\$2.60 billion in damage to the Trade Sector's buildings is further dissected by the means of damage execution, revealing the tactics used by the perpetrators. The data (Table 181) shows that the majority of the economic loss, a staggering 74.94% (US\$1.95 billion), resulted from Combined destructive methods. This category, which includes multiple destructive tactics used simultaneously such as artillery fire followed by looting and arson—highlights the pervasive, multifaceted, and intense nature of the assaults on commercial infrastructure.

Table 181. Damage to Building and Building accessories by Means of damage Executions (US\$ in Millions)

Method of Damage	Quantity damaged	Damage Value (US\$ in million)	Share (%)
Air Strikes	5449	7.75	0.3
Combined	1433313	1945.69	74.94
Gun-firing /bullet	15457	55.88	2.15
Heavy Artillery	9074	206.42	7.95
Looting	25267828	313.37	12.07
other	725	4.52	0.17
Setting on fire	121308	62.33	2.4
Grand Total		2595.96	100

Source: CITG 2022,2023

While the previous analysis of damage type (Table 180) identified Looting as the dominant factor by value (58.45), this current table (Table 181) clarifies that Looting as a standalone method of execution accounts for a distinct 12.07 % (US\$ 313.37 million) of the building damage value. The difference suggests that most of the economic loss from looting was integrated into the "Combined" attacks.

Other conventional military tactics like Heavy Artillery and Gun-firing/bullet caused 7.95% and 2.15% of the damage value, respectively, demonstrating that direct warfare accounted for a significant structural toll. This breakdown underscores that the total building devastation was not due to a single event but rather a systematic campaign involving both large-scale military bombardment and the subsequent economic crippling achieved through widespread and strategic looting.

Damage Severity Level

The US\$2.60 billion in damage to the Trade Sector's buildings, as established in the preceding analyses (Table 179), is devastatingly concentrated in the highest tiers of destruction. As shown in Table 182, the total economic loss is dominated by Complete Damage, which accounts for a staggering 72.47% of the value, equivalent to US\$1.88 billion. This indicates that the vast majority of the commercial building stock has been rendered entirely unusable and requires full replacement or reconstruction.

Table 182. Damage to Building and Building accessories by damage Severity Level (US\$ in Millions)

Level of damage	Quantity of damaged	Damage Value (US\$ in million)	Share (%)
Minor Damage	1443	3.36	0.13
Moderate Damage	104805	84.27	3.25
Severely Damage	3478578	627.1	24.15
Complete Damage	23268328	1881.22	72.47
Grand Total		2595.96	100

Source: CITG 2022,2023

This extreme severity level is compounded by Severely Damage structures, which contribute an additional 24.15% of the value (US\$627.10million). Together, these two highest tiers of destruction often corresponding to the Severely damage and complete damage severity categories represent over 96% of the total economic damage to buildings and their accessories. Conversely, the Minor and Moderate Damage categories are negligible, collectively accounting for less than 4 % of the value. The trade sector was not subjected to isolated attacks but rather a campaign of intense, high-value destruction aimed at ensuring the total functional collapse of the region's commercial infrastructure.

Damage Perpetrators

The final layer of analysis for the US\$2.60 billion in Trade Sector building and building accessories damage focuses on the perpetrators (Table 183), showing that the specific actors responsible for the destruction. The data indicates that the damage was largely the result of joint operations and the actions of a few major forces, confirming the widespread nature of the conflict and the coordinated assault on economic assets.

Table 183. Damage to Building and Building accessories by Perpetrators (US\$ in Millions)

Perpetrators	Quantity damaged	Damage Value (US\$ in million)	Share (%)
ENDF and EDF	7379	7.76	0.30
EDF_AMF	1318895	7.36	0.28
AMF	88427	72.6	2.80
ENDF_EDF_AMF	14433837	462.93	17.83
AFF	2504	27.48	1.06
ENDF	9426491	830.78	32.00
ENDF_EDF_IRF	114	3.57	0.14
IRF	596	2.4	0.09
EDF	1291664	387.56	14.93
ENDF_AMF	46	0.67	0.03
Combined	282648	792.57	30.53
EFP	543	0.21	0.01
ENDF_AFF_EDF	10	0.07	0.00
Grand Total		2595.96	100.00

Source: CITG 2022,2023

The largest single contributor by economic value is the Ethiopian National Defense Force (ENDF) alone, accounting for 32.00% of the total damage, (US\$830.78 million). This is followed closely by the Combined category (30.53%, or US\$ 792.57 million), representing damage caused by forces not individually specified or involving complex multi-force actions.

Significant contributions from other major groups include:

- Joint operations of ENDF, Eritrean Defense Force (EDF), and Amhara Forces (AMF), which caused 17.83% of the damage (US\$462.93 million).

- The Eritrean Defense Force (EDF) acting alone, responsible for 14.93% of the damage (US\$387.56 million).

Collectively, these four categories ENDF, Combined, ENDF_EDF_AMF, and EDF account for over 95% of the total building and building accessories damage value. The devastating attribution to various military and associated forces (including those in joint operations) strongly correlates with the findings from the previous tables: the high incidence of Combined and Heavy Artillery damage execution (Table 181) and the resulting Complete and Severe destruction (Table 182) were the direct consequence of military actions taken primarily by the ENDF, EDF, and their regional allies.

Damage Value of vehicles

The damage value of vehicles consists of the zonal distribution of firms reported damage in their vehicles: number of vehicles and/or their accessories, type of damage happened, method of damage implemented by the perpetrator, the share of perpetrators involved in the damage and severity of the damage.

Damage type

The result in Table 184 shows that Looting damage type stands out with the largest frequency of cases (2,209 incidents, 78.54%) and the highest monetary damage value (US\$ 64.99 million, 71.01%), making it the dominant form of damage to vehicles and accessories in this context. This high incidence of looting highlights significant loss of property and resources, which can have far-reaching economic and social consequences for the owners and users of these resources.

Table 184. Damage of Vehicles by damage type (US\$ in Millions)

Damage type	Quantity damaged	Damage Value (US\$ in million)	Share (%)
Broken	401	13.35	14.6
Burned	250	11.99	13.11
Looted	5645	64.99	71.01
Missing	68	1.15	1.25
Grand Total		91.48	100

Source: CITG 2022,2023

The total financial damage imposed upon the trade sector's vehicle convoy in Tigray as a consequence of the recent war is assessed at US\$91.48 million. An analysis of the primary damage type (Table 184) reveals that looting constitutes the devastating majority of losses, accounting for 5,645 vehicles and accessories, which translates to a substantial 71.01% of the total monetary damage (US\$64.99 million). This pervasive, large-scale theft of movable assets indicates a severe breakdown of security and property rights during the assessment period. The

remaining damages are primarily attributed to physical destruction, with "Broken" cases valuing US\$13.35 million (14.6%) and "Burned" vehicles totaling US\$11.99 million (13.11%). A comparatively minor category is "Missing" vehicles, representing only 1.25% of the total value. This distribution confirms that the primary mode of asset loss for the trade sector's transportation capacity was the deliberate removal and expropriation of vehicles rather than accidental destruction.

The catastrophic level of looting and physical destruction of vehicles carries severe implications for post-war recovery and the immediate restoration of the regional economy. The massive loss of transport assets directly cripples the trade sector's logistical capacity, impeding the movement of goods, humanitarian aid, and essential commodities, thereby disrupting supply chains and contributing to market instability. Furthermore, this scale of capital asset loss significantly raises the barriers to re-entry and business continuity for vehicle owners and firms, necessitating substantial and immediate foreign aid or large-scale, coordinated compensation mechanisms for vehicle replacement. The finding underscores the critical need for targeted interventions aimed at restoring secure transport infrastructure as a foundational step toward broader economic rehabilitation.

Means of Damage Execution

The result from Table 185 shows that there are numerous methods of damage adopted in causing vehicle destruction, but the three major methods stand out in terms of both frequency and damage value. Looting is the most prevalent method, accounting for 1,917 cases (68.20%) and causing damage valued at US\$ 59.43 million (64.96%). Theft follows with 363 cases (12.91%) and damage worth US\$ 8.17 million (8.93%). Setting on fire is the third most frequent method, with 272 cases (9.67%) and damage valued at US\$ 13.78 million (15.06%). Together, these three methods represent the bulk of both occurrence and economic impact among vehicle damage types.

Table 185. Damage to Vehicle by Means of damage Executions (US\$ in Millions)

Method of Damage	Quantity damaged	Damage Value (US\$ in million and %)	Share (%)
Air/Drone/artillery bombardments	12	0.46	0.5
Airp/Drone/Strick	37	1.89	2.07
Ground artillery bombardments	53	2.47	2.7
Gun-firing /bullet	214	5.27	5.76
Loot	2804	59.43	64.96
Setting on fire	343	13.78	15.06
theft	2901	8.17	8.93
Grand Total		91.48	100

Source: CITG, 2022, 2023

Overall, the findings indicate that looting is the primary cause for the vehicles damage, followed by theft and intentional burning, highlighting both economic loss and deliberate destruction.

The total economic damage to the trade sector's vehicle swift resulting from various execution methods is assessed at US\$91.48 million. The data from Table 185 indicates that non-kinetic and opportunistic methods constitute the devastating majority of the loss. Specifically, looting accounts for the primary share of destruction, resulting in US\$59.43 million of the total damage value. When combined with Theft, the damage value attributable to expropriation rises to US\$67.60 million of the overall financial damage. Intentional physical destruction, primarily through Setting on Fire, is the third-largest single category, responsible for US\$13.78 million. The damage resulting from active war, which includes Gun-firing/bullet (5.76%), Ground artillery bombardments (2.7%), and Air/Drone/Strike (2.07), collectively amounts to US\$10.10 million. This distribution highlights that while military action contributed to the damage value, the financial impact was dominated by widespread asset stripping and deliberate destruction post-engagement.

The implications of this distribution are threefold: First, the dominance of Looting and Theft signifies a profound breakdown in security and rule of law, suggesting that the primary economic losses are a result of widespread opportunism and illicit removal of assets rather than solely direct battlefield destruction. Second, the loss of these vehicles, which are essential capital assets, severely compromises the logistical spine of the trade sector, inhibiting the rapid movement of agricultural, medical, and commercial supplies, thus slowing humanitarian response and recovery. Finally, the high incidence of intentional destruction (Setting on Fire) suggests deliberate targeting of civilian economic capacity, which raises recovery costs and discourages private sector investment necessary for long-term economic stability in the region.

Damage Severity Level

Vehicles have suffered severe damage across multiple levels, with the majority concentrated at the highest severity (Table 186). Specifically, 2,436 vehicles (86.65%) experienced damage in the completed damage categories, accounting for US\$ 75.53 million (82.56%) of the total damage value. Smaller yet significant portions, 289 vehicles (10.28%), were damaged at the severely Damaged categories, contributing US\$ 13.61 million (14.88%). The moderate damage category (26-50%) accounts for 66 vehicles (2.35%) with US\$ 1.91 million (2.09%) in losses, while the least affected category minor damage comprises 20 vehicles (0.71%) with minimal

economic impact of US\$ 0.43 million (0.47%). This devastating concentration of damage value in the non-recoverable and near-total damage segments directly implies that traditional recovery models focused on vehicle repair and rehabilitation are largely irrelevant. The required intervention must be a comprehensive program of full capital replacement to restore the trade sector's logistical capacity, exponentially increasing the financial investment required for post-conflict economic revitalization.

Table 186. Damage to Vehicle by Damage severity Level (US\$ in Millions)

Level of Damage	Quantity damaged	Damage Value (US\$ in million)	Share (%)
Minor Damage	21	0.43	0.47
Moderate Damage	69	1.91	2.09
Severely damage	377	13.61	14.88
Complete Damage	5897	75.53	82.56
Grand Total		91.48	100

Source: CITG 2022,2023

Perpetrators

The data (Table 187) on perpetrators responsible for damage to vehicles indicates a diverse range of actors, with the Ethiopian National Defence Force (ENDF) being the most frequent perpetrator. The result shows that the two major perpetrators of damage to vehicles and accessories are the Ethiopian National Defence Force (ENDF) and the Eritrean Defence Force (EDF). ENDF accounts for the largest share with 50.24% and 2,250.4 vehicles damaged, resulting in an estimated economic loss of US\$52.87 million, which is 57.78% of the total damage value. EDF follows as the second major contributor with 483 cases (17.17%) and 3,007 vehicles damaged, causing damage valued at US\$19.13 million (20.91%). Together, these two forces are responsible for the majority of damage both in terms of frequency and monetary value, highlighting their dominant role in the destruction of vehicles during the war.

Table 187. Damage to Vehicles by Share of Perpetrators (US\$ in Millions)

Perpetrators	Quantity damaged	Damage Value (US\$ in million)	Share (%)
AFF	3	0.09	0.1
AMF	633	9.09	9.93
EDF	3007	19.13	20.91
EDF _ENDF _AMF	91	1.76	1.92
EDF _AMF	47	0.73	0.8
EFP	3	0.03	0.03
ENDF	2250	52.87	57.78
ENDF _EDF	206	4.42	4.83
ENDF _AMF	8	0.17	0.19
ENDF _EFP_ EDF _AMF Amhara Forces	15	0.59	0.64
ENDF _EDF _AFF	11	0.3	0.33
IRF	90	2.3	2.51
Grand Total	6364.4	91.48	100

Source: CITG,2022,2023

Damage values of Fixed Equipment

The damage value of fixed requirements is determined by a comprehensive set of factors, including the firms' categories as reporting damage, the specific parts of fixed assets and accessories affected, the type and method of damage execution by perpetrators, the share of perpetrators involved, firm evidence of ownership for the assets, and documentation confirming the damage.

Damage Type

The damage to permanent (fixed) equipment has primarily occurred through frequent and high-value in damage. Looting stands out as the most common damage type, with 3,215 incidents accounting for US\$ 993.24 million, which makes up around 92.44% of the total damage value. Gun-firing and bullets follow, with 161 incidents contributing US\$ 5.27 million (5.76%), and setting on fire affecting 272 cases with damages worth US\$ 13.78 million (15.06%). These three methods collectively constitute the majority of both the frequency of damage and the overall damage value, highlighting the intense and widespread nature of the war affected the damage of fixed assets during the war.

Based on Table 188, the damage to fixed assets resulted in a grand total value of US\$1,215.79 million. A granular analysis of the damage types reveals that looted assets constitute the vast majority of the economic loss, accounting for a staggering US\$1,123.21 million, which translates to 92.44% of the total damage value. This figure demonstrates that looting was the dominant mechanism for value loss among the reported categories. The remaining damage types contributed only minimally to the overall financial impact. Burned assets were the next largest category by value, at US\$56.69 million or 4.66%. Missing assets followed with US\$18.84 million (1.55%), and Broken assets caused the least financial damage at US\$17.05 million (1.4%). In essence, the data overwhelmingly indicates that the looting of fixed assets was the most economically destructive type of damage, dwarfing the combined monetary impact of broken, burned, and missing assets.

Table 188. Damage to Fixed Equipment by Damage Type (US\$ in Millions)

Damage type	Quantity damaged	Value (US\$ in million)	Share(%)
Broken	502619.6	17.05	1.4
Burned	362457	56.69	4.66
Looted	99324464	1123.21	92.44
Missing	319871.2	18.84	1.55
Grand Total		1215.79	100

Source: CITG 2022,2023

Means of Damage Execution

As indicated in Table 189, the methods used to damage permanent fixed equipment reveal that a grand total value of US\$1,215.79 million was incurred. The monetary value of the damage is highly concentrated in a few methods, with Looting being overwhelmingly the most significant. Looting alone accounts for a loss of US\$866.04 million, representing 71.23% of the total damage value. The second most damaging method is Theft, which caused losses of US\$243.26 million, constituting 20.01% of the total. Together, looting and theft are responsible for over 91% of the total financial damage to fixed assets. The remaining methods contribute much smaller shares: Setting on fire caused US\$33.69 million in losses (2.77%), followed closely by Air/Drone/Strike at US\$32.88 million (2.71%). Ground artillery bombardments contributed US\$25.80 million (2.12%), while gun-firing/bullet and the combination of many methods accounted for the smallest shares, at 0.69% and 0.47%, respectively. This distribution clearly highlights that those methods involving asset removal (looting and theft) were the primary drivers of damage value to fixed equipment during the reported period.

Table 189. Damage to Fixed Equipment by Means of Damage Execution (US\$ in Millions)

Method of Damage	Quantity damaged	Value (US\$ in million)	Share(%)
Air/Drone/Strike	3239858	32.88	2.71
Ground artillery bombardments	524070	25.8	2.12
Gun-firing /bullet	110187	8.39	0.69
Looting	91076541	866.04	71.23
Setting on fire	177250	33.69	2.77
theft	4930205	243.26	20.01
Two and more methods	451298	5.74	0.47
Grand Total		1215.79	100

Source: CITG,2022,2023

Damage Severity Level

Based on Table 190, the analysis of fixed equipment damage categorized by severity level reveals a dominant pattern of near-total destruction, resulting in a total financial loss of US\$1,215.79 million. The vast majority of the damage value is concentrated in the Complete Damage category. This highest level of destruction accounts for a staggering US\$1,157.44 million, which represents 95.19% of the total damage value.

Table 190. Damage of Fixed Equipment by Damage Severity Level (US\$ in Millions)

Level of Damage	Quantity damaged	Value (US\$ in million)	Share (%)
Minor Damage	1723434	1.96	0.16
Moderate Damage	54276	11.61	0.96
Severely Damage	6944149.42	44.78	3.69
Complete Damage	91787552.15	1157.44	95.19
Grand Total		1215.79	100

Source: CITG,2022,2023

The remaining three severity levels collectively account for less than five percent of the total financial loss. Severely Damage is the next largest category, valued at US\$ 44.78 million (3.69%). This is followed by Moderate Damage at US\$ 11.61 million (0.96%). The least financially impactful category is Minor Damage, which accounts for only US\$ 1.96 million, or 0.16% of the total.

In summary, the figures clearly demonstrate that the financial damage to fixed assets was overwhelmingly driven by Complete Damage, highlighting that the equipment loss was characterized by high-level, almost total destruction rather than partial or minor impairment.

Damage Perpetrators

Table 191 indicates that the analysis of perpetrators responsible for the damage to fixed equipment reveals a total financial damage value of US\$1,215.79 million, with the economic impact largely concentrated among a few specific forces and their combinations. The single largest financial contributor to the damage is the Amhara Forces (AMF), causing losses valued at US\$277.44 million, which represents 22.82% of the total damage. The next most financially destructive forces are the combined units: the ENDF_EDF forces inflicted the second-highest damage value at US\$248.60 million (20.45%), closely followed by the Eritrean Defence Force (EDF) acting alone, responsible for US\$216.72 million (17.83%) in losses. Collectively, these three categories, AMF, ENDF_EDF, and EDF, account for over 61% of the total recorded damage value. Other significant contributors include the ENDF (Ethiopian National Defence Force) at US\$100.21 million (8.25%), and two different combined forces, EDF_AMF and ENDF_EDF_AMF, which are responsible for a nearly identical share of damage at US\$104.53 million (8.6%) and US\$104.55 million (8.6%), respectively. The remaining individual forces and combinations each account for 5% or less of the total damage value. This strong concentration of damage value underscores the dominant role played by the Amhara Forces and the forces involving the ENDF and EDF in the overall destruction of fixed assets.

Table 191. Damage of Fixed Equipment by Damage Perpetrators (US\$ in Millions)

Perpetrators	Quantity damaged	Value (US\$ in million and %)	Share (%)
AFF	5339233	47.57	3.91
AMF	39332832	277.44	22.82
EDF	15366978	216.72	17.83
EDF_AMF	1865325	104.53	8.6
EDF_ENDF_IRF	6424	0.11	0.01
ENDF	9937	1.31	0.11
ENDF	4895464	100.21	8.25
ENDF_EDF	9670527.7	248.6	20.45
ENDF_EDF_AMF	1697781	104.55	8.6
ENDF_AMF	54058	1.76	0.14

Perpetrators	Quantity damaged	Value (US\$ in million and %)	Share (%)
ENDF_EDF_AFF	2295	0.07	0.01
IRF	20196415.	60.71	5
Combined More than 3 Forces	2072136	52.22	4.29
Grand Total		1215.79	100

Source: CITG,2022,2023

Damage values of Office Furniture

The damage values for Office Furniture were determined by considering the type of damage incurred, the method of damage implemented by the perpetrators, the percentage of perpetrators involved in the damage, and the level (severity) of damage.

Damage Type

The total estimated asset damage to office furniture within the trade sector is US\$1,215.79 million. As indicated in Table 192, the damage types reveal a crucial distinction between the volume of damaged assets and the financial value of the loss. The devastating majority of the financial damage, 95.19%, is attributed to assets classified as Missing, valued at US\$1,157.44 million. This extreme concentration of value in the 'Missing' category is noteworthy, particularly since it relates to only 2,435 items, suggesting these were high-value, specialized pieces of equipment or premium furniture.

Table 192. Damage to Office furniture by Damage Type (US\$ in Millions)

Damage Type	Quantity damaged	Damage Value (US\$ in Millions)	Share (%)
Broken	2814	1.96	0.16
Burned	15166	11.61	0.96
Looted	432084	44.78	3.69
Missing	2435	1157.44	95.19
Grand Total		1215.79	100

Source: CITG 2022,2023

Conversely, while assets classified as Looted represent the largest quantity of units damaged (432,084 items), their associated financial loss is comparatively minimal at US\$44.78 million, representing only 3.69% of the total damage value. This implies that the looted items were, on average, of lower unit value (e.g., standard chairs, smaller desks). Damage from burned assets accounts for US\$11.61 million (0.96% of value), and Broken items contribute the smallest financial share at US\$1.96 million (0.16% of value). Overall, the data clearly establishes Missing assets as the principal driver of economic loss, despite the mass volume of Looted items.

The extreme concentration of loss in the 'Missing' category (95.19% of value) necessitates a recovery strategy focused on high-value capital replacement and verification. The disproportionate financial loss implies a strategic removal of the most valuable office components, requiring precise verification of the valuation methodology to prevent cost inflation during reconstruction. Conversely, the vast quantity of Looted items (432,084 units), despite their low unit value, requires a mass-scale procurement strategy of standard, lower-cost furniture to re-establish basic operational capacity across numerous facilities immediately. The evidence of residual Broken and Burned assets, although minor financially, suggests the need for targeted, small-scale repair programs that can be executed quickly to finalize the restoration of individual offices. Addressing these distinct damage patterns requires dual-track financing: specialized funding for high-value replacements and bulk purchasing for volume replacement.

Means of Damage Executions

Multiple methods were employed to damage office furniture, with looting, theft, and gun-firing/bullet attacks emerging as the three most significant in terms of frequency and direct damage value (Table 193). Looting ranks first in frequency, affecting a massive 395,907 units and causing the highest financial loss among these specific categories at US\$4.43 million (58.74%). Theft follows as the second-highest financial contributor, damaging 36,143 units and accounting for US\$2.43 million (32.18%) in damage value. Gun-firing and bullet attacks impacted 4,004 units, resulting in a minor US\$0.16 million (2.12%) loss. Collectively, these methods dominate the documented destruction of office furniture, highlighting the widespread and varied tactics of violence and removal used during the war.

Table 193. Damage to office Furniture by Means of Damage Executions (US\$ in Millions)

Method of Damage	Quantity damaged	Damage Value (US\$ in million)	Share (%)
Air/Drone Strick/attack	923	0.12	1.59
Ground artillery bombardments	460	0.24	3.18
Gun-firing /bullet	4004	0.16	2.12
Looting	395907	4.43	58.74
Other	461	0.05	0.66
Setting on fire	14601	0.11	1.46
Theft	36143	2.43	32.18
Grand Total		7.55	100

Source: CITG 2022,2023

Damage Severity Level

The total recorded damage value for office furniture based on assessed severity is US\$7.55 million. The data in Table 194 clearly establishes that the overwhelming majority of this

financial loss is concentrated in the highest severity level: Complete Damage. The complete damage category accounts for 446,267 units and represents an amazing 96.17% of the total financial damage value, at US\$7.26 million. This finding is crucial as it indicates that furniture that was not removed was largely rendered irreparable and useless.

Table 194. Damage to Office Furniture by Damage Severity Level (US\$ in Millions)

Level of Damage	Quantity damaged	Damage Value (US\$ in million)	Share(%)
Minor Damage	1896	0.05	0.66
Moderate Damage	2074	0.06	0.79
Severely damage	2262	0.18	2.38
Complete Damage	446267	7.26	96.17
Grand Total		7.55	100

Source: CITG 2022,2023

In sharp contrast, the less severe damage levels, Minor, Moderate, and Severely damaged assets, are financially insignificant. Severely damaged furniture accounts for US\$0.18 million (2.38%), while the Moderate and Minor categories combine for less than 1.5% of the total value (US\$0.11 million). This distribution confirms that partial or reparable damage was minimal compared to complete and total destruction.

The high concentration of damage in the "Complete Damage" category (96.17% of value) has profound implications when combined with the prior finding that Missing assets accounted for 95.19 % (Table 192) of the total furniture loss. This dual reality means the trade sector has experienced a near-total loss of office assets through two distinct mechanisms: strategic removal (Missing assets) and systematic destruction (Complete Damage). Consequently, the recovery strategy cannot rely on repair or partial rehabilitation programs. The overwhelming severity dictates a strategy of total capital replacement across the affected enterprises. Resources must be allocated for large-scale, one-off procurement to rapidly equip offices with basic operational furniture, as investing in repair and restoration programs for the small fraction of Minor or Moderately damaged items would be highly inefficient and delay the overall restart of commercial activity.

Damage Perpetrators

As indicated above in Table 195, the total recorded damage value for office furniture, assessed at US\$7.55 million, reveals a concentration of responsibility across various individual and joint armed groups. The single largest financial contributor to this destruction is the Amhara Forces (AMF), which accounts for US\$3.64 million, representing a dominant 48.21% of the total damage value while affecting 89,599 units. The second-highest financial loss is attributed to the broadly defined "Combined" category (US\$1.59 million or 21.06 %), followed by the

Eritrean Defense Forces (EDF) at US\$0.57 million (7.55\%). Notably, while the joint force of ENDF, EDF, and AMF damaged the highest quantity of units (302,769), their financial contribution is relatively minor at US\$0.28 million (3.71%). This distinction suggests that individual forces like the AMF were responsible for higher-value destruction, while the large-scale joint operations focused on mass-volume, lower-value destruction or removal. Collectively, these forces are responsible for the vast majority of the documented asset damage.

Table 195. Damage to Office Furniture by Damage Perpetrators (US\$ in Millions)

Perpetrators	Quantity damaged	Value (US\$ in million)	Share (%)
AFF	1657	0.17	2.25
AMF	89599	3.64	48.21
EDF	9825	0.57	7.55
EDF_AMF	3299	0.39	5.17
EFP	264	0.07	0.93
ENDF	3839	0.14	1.85
ENDF_AMF	22	0.02	0.26
ENDF_EDF	4823	0.38	5.03
ENDF_IRF	230	0.02	0.26
ENDF_EDF_AMF	302769	0.28	3.71
IRF	5878	0.28	3.71
Combined	30242	1.59	21.06
Others	52	0	0
Grand Total		7.55	100

Source: CITG,2022,2023

Damage values of Electrical Equipment

The damage value of electronics was determined by considering the type of damage incurred, the method of damage implemented by the perpetrators, the share of perpetrators involved in the damage, and the level (severity) of damage.

Damage Type

Table 196 stated that the total documented asset damage to electrical equipment (big and small) across the trade sector is US\$41.10 million. The analysis by damage type reveals a devastating dominance by Looting, which accounts for US\$37.08 million, or a massive 90.21% of the total damage value. This plundering affected an extraordinary 7,700,453 units, clearly indicating a systemic, mass-scale removal of electrical infrastructure, appliances, and smaller devices. The second-largest financial contributor is Burned equipment, which caused US\$3.02 million in losses, representing 7.35% of the total value across 267,274 units. Missing equipment accounts for a minor financial share, valued at US\$0.56 million (1.36 %), despite involving only 6,296 units. Finally, Broken equipment contributed the smallest financial loss at US\$0.44 million (1.07%). The overwhelming financial and volumetric impact of Looting establishes it as the principal mechanism of destruction for electrical assets.

Table 196. Damage to Electrical Equipment's by Damage Type (US\$ in millions)

Damage type	Quantity damaged	Damage Value (US\$ in million)	Share (%)
Broken	3426	0.44	1.07
Burned	267274	3.02	7.35
Looted	7700453	37.08	90.21
Missing	6296	0.56	1.36
Grand Total		41.10	100.00

Source: CITG 2022,2023

Means of Damage Executions

The major methods adopted to damage electrical equipment include theft, looting, and gun-firing/bullet attacks (Table 197). Theft is the most frequent method, with 4,653 cases (52.82%), damaging 520,995 units and causing losses amounting to US\$ 20.23 million (49.21% of total damage value). Looting is the second most common method with 3,278 cases (33.38%), impacting 7,165,618 units and resulting in damage valued at US\$ 16.68 million (40.57%). Gun-firing and bullet attacks account for 512 cases (5.81%), damaging 22,951 units and causing US\$ 1.09 million (2.66%) in damage value. These three methods collectively account for the vast majority of damage to electrical equipment, highlighting severe and widespread destruction affecting critical infrastructure.

Table 197. Method of damage employed on electrical equipment by perpetrators

Method of Damage	Quantity damaged	Value (US\$ in million)	Share (%)
Air/Drone/Strick	4	0.005	0.01
Ground artillery bombardments	682	0.126	0.31
Gun-firing /bullet	22951	1.094	2.66
Looting	7165618	16.675	40.57
Setting on fire	267199	2.968	7.22
Theft	520995	20.229	49.21
Grand Total		41.10	100.00

Source: CITG 2022,2023

Damage Severity Level

The severity of damage to electrical equipment is overwhelmingly high, with 8,374 cases (95.07%) experiencing complete damage (76-100%). This level accounts for 7,716,868 units damaged, with a total damage value of US\$39.67 million, representing 96.49% of the total damage value. Moderate damage between 51-75% affects 361 cases (4.10%), damaging 259,506 units and causing US\$1.24 million (3.02%). Relatively lesser damage between 1-25% and 26-50% combined accounts for less than 1% of cases and damage values (Table 198). This distribution clearly shows that electrical equipment mostly suffered near-total damage, highlighting severe destruction and significant implications for restoration efforts.

Table 198. Level of Damage occurred on the Electrical Equipment

Level of Damage	Quantity damaged	Damage Value (US\$ in million)	Share(%)
Minor damage	916	0.09	0.22
Moderate Damage	159	0.11	0.27
severely Damage	259506	1.24	3.02
Complete damage	7716868	39.67	96.49
Grand Total		41.10	100.00

Source: CITG 2022,2023

Damage Perpetrators

The top four perpetrators causing damage to electrical equipment are EDF, Amhara Forces, ENDF & EDF combined forces, and the combined three or more forces group (Table 199). EDF leads with 2,515 incidents (28.56%), damaging approximately 446,227 units and causing damage worth US\$16.32 million (39.71%). Amhara Forces follow with 2,225 cases (25.26%), damaging 88,643 units and incurring US\$4.84 million (11.77%) in damage value. The combined ENDF and EDF forces caused 1,867 cases (21.21%), damaging 817,566 units and inflicting US\$10.28 million (25.02%) in damage value. The combined three or more forces group contributed 984 incidents (11.17%) impacting 5,525,896 units and causing US\$5.67 million (13.80%) in damages. Collectively, these groups are responsible for the majority of electrical equipment damage, significantly impacting infrastructure and service delivery

Table 199. Perpetrators of the damage on electrical equipment

Perpetrators	Quantity damaged	Value (US\$ in million)	Share (%)
AFF	2109	0.10	0.24
AMF	88643	4.84	11.77
EDF	446227	16.32	39.71
EDF_AMF	1005218	0.45	1.09
EFP	56220	1.48	3.60
ENDF	12985	0.48	1.17
ENDF_EDF	817566	10.28	25.02
ENDF_EDF_AMF	5999	1.01	2.46
IRF	16586	0.47	1.14
Combined More than three forces	5525896	5.67	13.80
Grand Total		41.10	100.00

Source: CITG 2022,2023

Damage values of ICT Equipment

The damage value of information and communication technology (ICT) consisted of the type of damage that occurred, the method of damage implemented by the perpetrators, the share of perpetrators involved in the damage, and the level (severity) of damage.

Damage Type

Damage type result on ICT equipment shows that looting is the predominant damage type, accounting for 1,957 cases (88.44%) and damaging 382,692 units, resulting in damage valued at US\$ 7.79 million (90.69% of the total damage value). Missing equipment follows with 171 cases (7.73%), damaging 9,320 units and causing US\$ 0.61 million (7.10%) in damage values. Broken and burned equipment constitute relatively smaller shares, with 44 cases (1.99%) and 41 cases (1.85%) respectively, together contributing less than 2.21% of the total damage value (Table 200). This reflects that ICT damage is overwhelmingly driven by large-scale looting, severely impacting information and communication infrastructure.

Table 200. Type of damage on ICT Equipment

Damage type	Quantity damaged	Damage Value (US\$ in million)	Share (%)
Broken	307	0.06	0.70
Burned	333	0.13	1.51
Looted	382692	7.79	90.69
Missing	9320	0.61	7.10
Grand Total		8.59	100.00

Source: CITG 2022,2023

Means of Damage Execution

The major methods adapted to damage ICT equipment include theft, looting, and gun-firing/bullet attacks (Table 201). Theft is the most significant method, occurring in 1,402 cases (63.37%), damaging 360,496 units, and causing damage value of US\$ 4.90 million, which is 57.08% of the total damage value. Looting follows with 701 incidents (31.67%), affecting 30,953 units and causing US\$ 3.29 million (38.29%). Gun-firing and bullet attacks are relatively less frequent, with 38 cases (1.72%), damaging 740 units and accounting for US\$ 0.09 million (1.05%) in damage value. The data indicate that theft and looting are the primary methods of destruction adopted for the damage of ICT equipment during the war.

Table 201. Method of damage employed on ICT equipment

Method of Damage	Quantity damaged	Damage Value (US\$ in million)	Share (%)
Air/Drone/Strike	54	0.03	0.35
Ground artillery bombardments	120	0.09	1.05
Gun-firing /bullet	740	0.09	1.05
Looting	30953	3.29	38.29
other	11	0.00	0.00
Setting on fire	278	0.18	2.10
theft	360496	4.90	57.08
Grand Total	392652	8.59	100.00

Source: CITG 2022,2023

Damage Severity Level

The severity of damage to ICT equipment during the conflict is predominantly very high. Most cases, 2,111 out of 2,213 (95.39%), experienced damage in the 76-100% range, affecting 390,224 units and causing damage valued at US\$ 8.09 million, which accounts for 94.26% of the total damage value. Moderate damage (51-75%) affected 50 cases (2.26%), damaging 1,103 units with damage value of US\$ 0.12 million (1.40%). Relatively lesser damage levels of 1-25% and 26-50% combined constitutes only around 2.35% of cases and cause lower economic damage (Table 202). This highlights that ICT equipment suffered almost complete destruction, severely disrupting communication infrastructure and necessitating extensive rebuilding efforts.

Table 202. Level of damage occurred on ICT equipment

Level of Damage	Quantity damaged	Damage Value (US\$ in million)	Share (%)
Minor Damage	31	0.02	0.23
Moderate Damage	1294	0.37	4.31
severely damage	1103	0.12	1.40
Complete Damage	390224	8.09	94.26
Grand Total		8.59	100.00

Source: CITG 2022,2023

Damage Perpetrators

The data on perpetrators responsible for damage to ICT equipment in firms shows diverse involvement of various armed groups, both individually and in joint operations. The top four perpetrators of damage on ICT equipment are EDF, Amhara Forces, ENDF & EDF combined forces, and combined three or more forces groups (Table 203). EDF leads with 490 cases (22.14%), damaging 180,501 units and causing US\$ 1.59 million (18.52%) in damage values. Amhara Forces accounted for 177 cases (8.00%), damaging 2,976 units and causing US\$ 0.57 million (6.64%). The combined ENDF and EDF forces are responsible for 489 cases (22.10%), damaging 15,587 units and causing US\$ 0.54 million (6.29%). Combined three or more forces caused 440 cases (19.88%), damaging 52,063 units and causing US\$ 2.55 million (29.68%). These groups collectively are the primary agents behind the extensive destruction of ICT infrastructure during the war.

Given the crucial role of ICT assets in communication, data management, and overall business operations, such widespread damage severely undermines firms' data security, privacy, functionality, and resilience.

Table 203. Perpetrators of the damage on ICT Equipment

Perpetrators	Quantity damaged	Damage Value (US\$ in million)	Share (%)
AFF	1615	0.10	1.16
AMF	2976	0.57	6.64
EDF	180501	1.59	18.52
EDF_IRF	1263	0.03	0.35
EDF_AMF	851	0.38	4.43
EFP	20	0.00	0.00
ENDF	11252	0.48	5.59
ENDF_EDF_AMF	5362	0.47	5.47
ENDF_AMF	4	0.00	0.00
ENDF_EDF	15587	0.54	6.29
ENDF_IRF	6	0.00	0.00
IRF	121152	0.60	6.98
Combined	52063	2.55	29.68
Grand Total	392652	8.59	100.00

Source: CITG 2022,2023

Damage values of Goods in Transit

The damage value of goods in transit (shipping) consisted of the type of damage that occurred, the method of damage implemented by the perpetrators, and the share of perpetrators involved in the damage.

Damage Type

The damage types that occurred on goods in transit (import) indicate that the majority of economic damage is due to missing goods, accounting for 450 cases (28.41%), with a quantity of 450 and a value of US\$ 1,848.67 million, which is 98.03% of the total damage value. Looting also caused significant damage, with 894 cases (56.43%) and 889 units damaged, resulting in US\$ 29.48 million (1.56%) in damage value. Broken and burned goods make up relatively smaller portions of damage, with 202 cases (12.75%) and 38 cases (2.40%), respectively, causing US\$ 6.59 million (0.35%) and US\$ 1.17 million (0.06%) in damage values (Table 204). This distribution highlights that missing goods represent the greatest financial impact on goods in transit during the war.

Table 204. Type of Damage occurred on Goods in Transit

Damage type	Quantity damaged	Value (US\$ in million)	Share(%)
Broken	202	6.59	0.35
Burned	38	1.17	0.06
Looted	889	29.48	1.56
Missing	450	1848.67	98.03
Grand Total		1885.91	100.00

Source: CITG 2022,2023

Means of Damage Executions

The major methods adopted to damage goods in transit (import) are dominated by looting, theft, and setting on fire (Table 205). Looting is the primary method with 1,382 incidents (87.24%), damaging 1,377 units and causing damage valued at US\$ 1,181.17 million, constituting 62.66% of the total damage value. Theft follows with 93 occurrences (5.88%), damaging 93 units and resulting in damage value of US\$ 2.75 million (0.15%). Setting on fire accounts for 101 cases (6.37%), damaging 101 units and causing damage value worth US\$ 1.85 million (0.10%). The remaining methods, including air/drone strikes, ground artillery bombardments, and gunfire/bullet attacks, collectively account for a relatively small portion of the damage. This indicates that direct physical seizure and illegal taking dominate the methods used to damage goods in transit during the war.

Table 205. Method of Damage adopted for the goods in Transit

Method of Damage	Quantity damaged	Damage Value (US\$ in million)	Share (%)
Air/Drone/ Strike	2	0.07	0.0001
Ground artillery bombardments	3	0.01	0.0001
Gun fire/bullet	3	0.05	0.0001
Looting	1377	1181.17	62.66
Setting on fire	101	1.85	0.10
theft	93	2.75	0.15
Grand Total		1885.91	100.00

Source: CITG 2022,2023

Damage Severity Level

From the method of damage observed in Table 205, it is clear that most of the goods in transit suffered looting. This indicates that the goods in transit experienced the most severe damage, to the point where they are completely ruined and can only be recovered through full replacement.

Damage Perpetrators

The data on perpetrators responsible for damage to goods in transit or being shipped reveals a wide range of actors involved, with notable contributions from both regional and federal forces. The top four perpetrators responsible for damage to goods in transit (import), based on frequency and damage value, are the Amhara Forces, Afar Regional Force, Federal Government, and Federal Addis Ababa (Table 206). The Amhara Forces are the leading perpetrators with 499 incidents (31.5%), damaging 499 units and causing damage valued at approximately US\$1,851.58 million, which accounts for 98.2% of the total damage value. The Afar Regional Force follows with 439 incidents (27.7%), damaging 439 units and causing

damage worth US\$14.93 million (0.79%). The Federal Government is next with 371 incidents (23.4%), damaging 371 units and causing US\$10.55 million (0.56%) in damage value. Federal Addis Ababa accounts for 121 incidents (7.6%), damaging 121 units and causing damage of about US\$2.81 million (0.15%).

Table 206. Perpetrators of the damage to the goods in transit

Perpetrators	Quantity damaged	Damage Value (US\$ in million)	Share (%)
AFF	439	14.93	0.79
AMF	499	1851.58	98.20
EDF	28	1.31	0.07
ENDF	27	1.00	0.05
ENDF_EDF_EFP_IRF	2	0.02	0.001
ENDF_AFF	3	0.05	0.003
ENDF_AMF	12	1.03	0.05
ENDF_EDF	38	1.36	0.07
ENDF_EDF_AMF	13	0.22	0.01
Federal A/Ababa	121	2.81	0.15
Federal Dire Dawa	4	0.04	0.002
Federal Government	371	10.55	0.56
Irregular Armed Groups	14	0.79	0.04
Oromia regional state	7	0.17	0.009
Somali regional state	1	0.04	0.002
Grand Total	1579	1885.91	100.00

Source: CITG 2022,2023

Together, these perpetrators account for the vast majority of the damage to goods in transit during the war, emphasizing the concentrated impact on supply chains and imports through the regions. This implies that the involvement of diverse and multiple perpetrators, including federal and regional forces, highlights the complex and fragmented nature of insecurity affecting goods in transit.

Damage values of consumable and finished goods

The damage value of consumable and finished goods consisted of the type of damage that happened on consumable and finished goods and accessories, the method of damage implemented by the perpetrators, the percentage of perpetrators involved in the damage, and the level (severity) of damage.

Damage Type

The damage to consumable and finished goods during the conflict is overwhelmingly driven by looting, which makes up 37,000 cases (88.69% of total incidents) and causes damage valued at US\$361.94 million, representing 89.52% of total damage value. Missing goods also constitute significant losses, with 3,016 cases (7.23%) damaging 46.22 million units and causing US\$21.36 million (5.28%). Burned goods account for 1,306 cases (3.13%) with

damage worth US\$17.85 million (4.42%), while broken goods make up a relatively smaller share of 151 cases (0.36%) with US\$6.59 million (1.63%) in damage value. Other forms of damage are minimal but contribute US\$2.73 million (0.68%) (Table 207). These figures highlight that looting is the main driver of the damage to consumable and finished goods in the war, severely impacting supply and market availability.

Table 207. Damage Type occurred on consumable and finished goods

Damage type	Quantity damaged	Damage Value (US\$ in million)	Share (%)
Broken	68052	6.59	1.63
Burned	53525861	17.85	4.42
Looted	1175787846	361.94	89.52
Missing	46220205	21.36	5.28
other	4938773	2.73	0.68
Grand Total		404.26	100.00

Source: CITG 2022,2023

Means of Damage Executions

The methods adapted to damage consumable and finished goods during the conflict predominantly involve looting, theft, and setting them on fire (Table 208). Looting is the main method, accounting for 36,956 cases (88.57%), which damaged roughly 1,169,820,935 units and caused losses worth US\$361.63 million, making up 89.44% of the total damage value. Theft follows with 3,032 cases (7.27%), damaging 45,391,602 units and leading to damage worth US\$21.47 million (5.31%). Setting on fire, while less frequent at 1,218 cases (2.92%), caused significant damage valued at US\$16.26 million (4.02%). Other physical damage types, such as air/drone strikes, ground artillery bombardments, and gunfire, accounted for relatively minor proportions of damage collectively. This shows that the destruction of consumable and finished goods is largely driven by large-scale theft and looting, severely affecting supply chains and market availability.

Table 208. Method of Damage employed by perpetrators on consumables

Method Of damage	Quantity damaged	Damage Value (US\$ in million)	Share (%)
Air/Drone/ Strike	11984725	1.31	0.32
Ground artillery bombardments	5477170	0.48	0.12
Gun-firing /bullet	213690	0.09	0.02
Looting	1169820935	361.63	89.44
Other	4987048.475	3.03	0.75
Setting on fire	42665564.6	16.26	4.02
Theft	45391602.46	21.47	5.31
Grand Total		404.26	100.00

Source: CITG 2022,2023

Damage Severity Level

The data (Table 209) indicates that the vast majority of damage incidents, 93.56% of cases, are severe, falling within the 76–100% damage range. This category accounts for an overwhelming 95.48% share of the total damage value, amounting to about US\$386 million. This highlights that while the number of cases might be fewer compared to smaller damage categories, their economic impact is drastically higher, representing complete damage of the affected goods.

Table 209. Level of Damage occurred on consumables

Level of Damage	Quantity damaged	Damage Value (US\$ million)	Share(%)
Minor damage	2979	0.02	0.01
Moderate Damage	1076923	0.34	0.08
severely Damage	84903754	17.87	4.42
Complete Damage	1194557079	386.03	95.48
Grand Total		404.26	100.00

Source: CITG 2022,2023

On the other hand, moderate damages (51–75%) make up only 6.21% of the cases but contribute a significant 4.42% of damage, valued at nearly US\$18 million. This indicates severe damage to goods, which, though not total, still results in meaningful damage value. Damage levels in the lower brackets, 1–25% and 26–50%, collectively represent a relatively small fraction of the damage cases (about 0.23%), and their contribution to the overall damage value is negligible (less than 0.1% combined). This situation leads to significant revenue losses, increased replacement costs, and challenges in meeting market demand.

Damage Perpetrators

The data on perpetrators responsible for damage to consumable and finished goods reveals the involvement of multiple armed groups, with some playing more prominent roles. The top four perpetrators of damage to consumable and finished goods during the conflict are Amhara Forces, EDF, ENDF & EDF combined forces, and ENDF alone (Table 210). Amhara Forces are responsible for 3,282 cases (7.87%), damaging approximately 362.99 million units with damage valued at US\$70.44 million (17.43% of the total damages). EDF caused the highest number of cases at 11,657 (27.95%), damaging 157.21 million units, resulting in US\$70.16 million (17.35%) in damage value. The Combined ENDF and EDF forces account for 11,583 cases (27.78%), damaging 163.42 million units and causing US\$39.87 million (9.87%) in damage value. The ENDF alone is implicated in 2,535 cases (6.08%), damaging 50.69 million units and causing damage worth US\$84.49 million (20.91%).

Table 210. Perpetrators of damage to consumable goods

Perpetrators	Quantity damaged	Damage Value (US\$ in million)	Share(%)
AFF	72709071	12.79	3.16
AMF	362991716	70.44	17.43
EDF	157208341	70.16	17.35
EDF_AMF	22192499	30.25	7.48
EDF_IRF	72500.85	0.43	0.11
EDF_EFP_AMF	10079	0.04	0.01
EFP	5497278	0.16	0.04
EFP_AMF	5279	0.08	0.02
ENDF	50688768	84.49	20.91
ENDF_EDF	163421595	39.87	9.87
ENDF_IRF	1645183	0.05	0.01
ENDF_AMF	34081539.7	4.34	1.07
ENDF_AFF_EDF	565755	1.77	0.44
ENDF_EFP_EDF	168	0.01	0.003
ENDF_EDF_AMF	338089150	66.80	16.53
ENDF_EDF_IRF	11736682	0.83	0.21
ENDF_EFP_IRF	12552	0.08	0.02
IRF	57442138.15	17.34	4.29
AMF_IRF	168917	0.83	0.21
Others	2001524	3.51	0.86
Grand Total		404.26	100.00

Source: CITG 2022,2023

Together, these four perpetrators are responsible for the majority of damage to consumable and finished goods, reflecting complex interactions between multiple armed groups resulting in widespread damage

Damage values of Hazardous Chemicals

The damage value of hazardous chemicals consisted of the owner-perceived replacement value, the type of damage that occurred, the method of damage implemented by the perpetrators, the percentage of perpetrators involved in the damage, and the level(severity) of damage.

Damage Type

The predominant mode of damage to hazardous chemicals is looting, which accounts for 93.19% of incidents (5,171 cases) and represents 97.89% of the total damage valued at approximately US\$36.03 million (Table 211). This dominant pattern of damage suggests security breaches, theft, or unauthorized removal as the primary risk factor facing hazardous chemical inventories, resulting in significant value loss.

Table 211. Type of Damage occurred on Dangerous chemicals

Damage type	Quantity damaged	Damage Value (US\$ in million)	Share (%)
Broken	106	0.31	0.84
Burned	62	0.15	0.41
Looted	3987	36.03	97.89
missing	209	0.32	0.87
Grand Total		36.81	100.00

Source: CITG 2022,2023

Breaking the containers represent about 1.95% of cases, with 106 units damaged, incurring a damage value of US\$0.31 million (0.84% of total loss). This type of damage typically stems from handling accidents or storage failures. Burned chemicals account for 1.15% of cases and US\$0.15 million (0.41%) damage value, indicating fire or heat exposure incidents affecting chemical integrity. Missing chemicals, potentially linked to inventory discrepancies or misplacement, contribute 3.77% of cases and US\$0.32 million (0.87%) damage value.

Means of Damage Executions

The destruction and damage to hazardous chemicals occur through a variety of methods, with theft and looting being the most significant contributors both in frequency and economic impact (Table 212). Theft is the leading method, accounting for 56.33% of damage incidents (3,126 cases) and causing approximately US\$11.80 million in damage value (32.05% of total value). This reflects high incidences of unauthorized removal or diversion of hazardous chemicals, which pose serious risks to public safety and environmental security. Looting contributes 38.90% of cases (2,157 incidents) and is responsible for the largest share of economic damage, valued at about US\$23.38 million (63.55%). Looting suggests organized or opportunistic raids resulting in significant chemical stock depletions or contaminations. Gun-firing / Bullet damage accounts for 2.99% of cases (166 incidents) and US\$1.45 million in damage (3.94%), reflecting the use of firearms in conflict or sabotage activities targeting hazardous chemical stores. Smaller yet notable contributions come from setting on fire (1.15%, 64 incidents, US\$0.14 million) and Air/Drone/Strike attacks (0.13%, 7 incidents, US\$0.02 million), indicating deliberate incendiary and aerial/missile assaults causing combustion or explosive damage. Ground artillery bombardments represent a minimal share (0.58%, 32 incidents, US\$0.02 million), suggesting limited use of heavy artillery directly causing chemical damage.

Table 212. Method of Damage adopted on dangerous chemicals

Method of Damage	Quantity damaged	Damage Value (US\$ in million)	Share (%)
Air/Drone/ Strike	7	0.02	0.05
Gun-firing /bullet	166	1.45	3.94
Ground artillery bombardments	31	0.02	0.05
Looting	995	23.38	63.55
setting on fire	63	0.14	0.38
theft	3102	11.80	32.05
Grand Total		36.81	100.00

Source: CITG 2022,2023

Damage Severity Level

The overwhelming majority of damage incidents to hazardous chemicals fall within the complete loss category of 76–100%, comprising 98.28% of all cases (5,452 incidents). This category also accounts for 98.39% of the total damage value, valued at approximately US\$36.21 million. This indicates that complete damage to hazardous chemicals results or loss of the quantities involved. Other damage levels of the 1–25%, 26–50%, and 51–75% constitute a relatively small fraction of the cases (less than 2%) and collectively contribute less than 1.63% to the total damage value (Table 213).

Table 213. Level of Damage on dangerous chemicals

Level of Damage	Quantity damaged	Value (US\$ in million)	Share (%)
Minor Damaged	4265	36.21	98.39
Moderate Damage	6	0.01	0.03
severely Damage	8	0.32	0.87
Complete Damage	85	0.27	0.73
Grand Total		36.81	100.00

Source: CITG 2022,2023

Damage Perpetrators

The damage to dangerous (hazardous) chemicals in firms involves various perpetrators. The combined forces of ENDF (Ethiopian National Defense Force) and EDF (Eritrean Defense Forces) are the leading perpetrators, responsible for 37.48% of the damage incidents (2,080 cases) and causing damage valued at approximately US\$20.85 million, which accounts for 56.63% of the total damage value (Table 214). This indicates significant involvement of joint military operations in damaging hazardous chemicals, reflecting the intensity and scale of conflict dynamics involving these forces. Amhara forces are the second largest group, contributing to 32.61% of cases (1,809 incidents) and about US\$5.39 million or 14.64% of the total damage value. The EDF accounts for 21.98% of damage cases (1,220 incidents) and approximately US\$3.89 million (10.57%) in damage value. ENDF alone is responsible for 3.03% of incidents (168 cases) and damage value of about US\$0.28 million (0.76%), a smaller

yet notable contribution compared to joint operations with EDF and other groups. Their involvement, though less in proportion, still contributes to cumulative damage.

Table 214. Perpetrators of the damage on dangerous chemicals

Perpetrators	Quantity damaged	Value (US\$ in million)	Share (%)
AFF	3	0.001	0.003
AMF	1801	5.393	14.64
EDF	1200	3.890	10.57
ENDF	167	0.279	0.76
ENDF_EDF	921	20.848	56.63
ENDF_EDF_AMF	142	3.024	8.22
IRF	57	1.492	4.05
Combined	73	1.884	5.12
Grand Total		36.81	100.00

Source: CITG 2022,2023

Damage values of Waste disposal equipment

The damage value of waste disposal equipment consisted of the owner-perceived replacement value, the type of damage that occurred, the method of damage implemented by the perpetrators, the percentage of perpetrators involved in the damage, and the level (severity) of damage.

Damage Type

The dominant damage type is Looting, representing 82.37% of incidents (257 cases) and driving the vast majority of economic loss (US\$4.16 million, 96.11% of total value). This indicates that forced seize is the primary threat to waste disposal assets. The next major category is breaking waste disposal equipment, with a share of 12.82% of incidents (40 cases), with 363 units damaged and US\$0.06 million (1.39%) of value (Table 215). This pattern often reflects handling accidents, wear, or structural failures.

Table 215. Type of Damage to the Waste Disposal Equipment

Damage type	Quantity damaged	Damage Value (US\$ in million)	Share (%)
Broken	363	0.06	1.39
Burned	2	0.0001	0.0001
Looted	488344	4.16	96.11
Missing/ Lost	43	0.01	0.23
Other	12096	0.09	2.08
Grand Total		4.33	100.00

Source: CITG 2022,2023

Means of Damage Executions

The result in Table 216 shows 312 incidents affecting 500,847.5 units, with a total value of US\$4.3331 million. The overwhelming majority of damage is driven by setting on fire, both in frequency and in value, indicating incendiary acts as the primary method of waste disposal equipment. Setting on fire(burning) is the dominant mechanism, causing 305 of the 312 total damage events (97.76% of incidents) and accounting for virtually all monetary damage value (US\$4.332 million, 99.98% of total value). Looting is a second but still substantial contributor, representing 7 events (2.24% of incidents) and resulting in US\$0.001 million (0.02%) of value.

Table 216. Method of Damage to Waste Disposal Equipment

Method of Damage	Quantity damaged	Value (US\$ in million)	Share(%)
Looting	304	0.001	0.02
Setting on fire	500544	4.332	99.98
Grand Total		4.333	100

Source: CITG 2022,2023

Damage Severity Level

The level of damage to waste disposal equipment in firms is predominantly complete/total destruction. The vast majority of damage falls in the highest damage category (76–100%), with 83.97% of incidents (262 cases) and US\$4.18 million accounting for 96.53% of the total value. This indicates that when waste disposal equipment is damaged, it tends to be complete destruction or impairment, leading to substantial financial losses per incident. The severe damage (51–75% category) accounts for 16.03% of incidents (50 cases) and US\$0.16 million (3.47%) of total damage value. Although less frequent, these events still contribute meaningful damage (Table 217).

Table 217. Level of Damage occurred on waste disposal equipment

Level of Damage	Quantity damaged	Damage Value (US\$ in million)	Share (%)
Severely Damage	12459	0.16	3.47
Complete Damage	488389	4.18	96.53
Grand Total		4.33	100

Source: CITG 2022,2023

Damage Perpetrators

The result shows that the destruction or damage of waste disposal equipment is overwhelmingly driven by ENDF actions, both in frequency and in damage value. ENDF (Ethiopian National Defense Force) is by far the dominant perpetrator, responsible for 97.44% of incidents (304 cases) and driving the vast majority of losses (US\$4.3319 million, 99.95% of total value). This indicates that ENDF activity is the primary driver of waste-disposal

equipment damage, with nearly all observed damage values concentrated in this group. The ENDF and EDF combined effect also occurred in 2 cases (0.64%) involving 2 units damaged but relatively less in monetary value.

Table 218. Perpetrators of the damage to Waste Disposal Equipment

Perpetrators	Quantity damaged	Damage Value (US\$ in million)	Share (%)
EDF	1	0.0003	0.007
EDF_IRF	280	0.0004	0.009
EDF_AMF	20	0.0001	0.002
ENDF	500543	4.3319	99.95
ENDF_EDF_AMF	2	0.00001	0.0001
END_EDF_IRF	1	0.0004	0.009
IRF	1	0.0001	0.002
Grand Total		4.3331	100.00

Source: CITG 2022,2023

Damage values of Merchandise goods

The damage value of merchandise goods consisted of the owner-perceived replacement value, the type of damage that occurred, the method of damage implemented by the perpetrators, the percentage of perpetrators involved in the damage, and the level (severity) of damage.

Damage type

The merchandise damages are dominated by the Burned and Looted categories. Looted items constitute the vast majority of incidents (96.89%), with 117,658 occurrences, and accounted for the largest share of damage value (US\$2,217 million, 95.84% of the total value). Burned appears second (1,706 incidents, 1.41%), while contributing a relatively lower portion of damage value (US\$25.65 million, 1.11%), compared to missing and breaking. Overall, 121,417 incidents affected 121,127 damaged units, with a total damage value of US\$2,313.02 million (Table 219).

Table 219. Type of Damage to the Merchandise Goods

Damage type	Quantity damaged	Value (US\$ in million)	Share (%)
Broken	963	32.03	1.38
Burned	1701	25.65	1.11
Looted	117389	2,217.03	95.84
Missing	1074	38.30	1.66
Grand Total		2,313.02	100

Source: CITG 2022,2023

Means of Damage Execution

The destruction methods employed by perpetrators against merchandise goods are diverse but show clear dominance in certain approaches (Table 220). Gun-firing or bullet damage

constitutes the largest share of incidents by a significant margin, accounting for 43.17% of damage events (52,409 cases) and resulting in a substantial damage value of approximately US\$714.43 million (30.88%). Theft follows closely, representing 27.47% of incidents (33,345 cases), yet slightly exceeding gunfire in damage value, with a damage value of US\$740.89 million (32.03%). Looting comprises 25.37% of events (30,795 cases) and is responsible for roughly US\$711.39 million (30.75%) of damage value, reflecting its critical role in both frequency and monetary damage. Relatively less frequent but still notable are ground artillery bombardments and air/drone/strike actions, contributing 0.96% (1,171 cases) and 0.60% (723 cases) of incidents with significant damage value of US\$63.97 million (2.77%) and US\$25.09 million (1.08%), respectively. Setting on fire accounts for 2.45% of events with a damage value of US\$ 57.23 million (2.48%).

Table 220. Method of Damage to the Merchandised Goods

Method of Damage	Quantity damaged	Value (US\$ in million)	Share(%)
Air/Drone/Strike	723	25.09	1.08
Ground artillery bombardments	1171	63.97	2.77
Gun-firing /bullet	52407	714.43	30.88
Looting	30583	711.39	30.75
Setting on fire	2973	57.23	2.48
Theft	33270	740.89	32.03
Grand Total		2,313.02	100

Source: CITG 2022,2023

This distribution highlights a complex damage landscape where armed conflict tactics (gunfire, artillery, and air strikes) and opportunistic criminal acts (theft and looting) combine to cause the majority of merchandise goods' destruction.

Damage Severity Level

The damage severity to merchandise goods is overwhelmingly concentrated in the complete damage bracket (occurring at the 76–100% damage level), with 98.87% of incidents (120,042 cases) and 96.47% of the total monetary damage value (US\$2,231.56 million) (Table 221). This indicates that the vast majority of damages result in total destruction of the merchandise involved. Severe damage levels between 51–75% contribute 0.98% of incidents (1,189 cases) and 3.20% of the total damage value (US\$74.01 million), reflecting some significant damage. Lower and moderate damage levels of 1–25% and 26–50% percent represent relatively lower shares of damage incidents and damage value, together encompassing just 0.15% of the cases and 0.33% of the total damage value.

Table 221. Level of Damage occurred to the Merchandise Goods

Level of Damage	Quantity damaged	Damage Value (US\$ in million)	Share(%)
Minor Damage	23	6.59	0.29
Moderate damage	163	0.85	0.04
Severely Damage	1188	74.01	3.20
Complete Damage	119753	2,231.56	96.47
Grand Total		2,313.02	100

Source: CITG 2022,2023

Damage Perpetrators

The top four perpetrators causing damage to merchandise goods are the Eritrean Defense Forces (EDF), the joint forces of ENDF and EDF, the Amhara Forces, and joint forces of three or more perpetrators. EDF leads in frequency with 38,975 cases (32.10% of total), damaging 38,928 units and causing an estimated US\$514.91 million in damage value (22.26%) (Table 222). The joint ENDF and EDF forces follow with 26,428 cases (21.78%), damaging 26,349 units and inflicting US\$368.91 million (15.95%) in damage. Amhara Forces rank third, accounting for 18,336 incidents (15.11%), damaging 18,181 units, with a substantial damage value of US\$561.91 million, the highest among all perpetrators at 24.29%. The fourth group, joint three or more forces, appeared in 18,673 cases (15.39%), damaging 18,673 units and resulting in US\$466.25 million (20.16%) in damage value.

Table 222. Perpetrators of the damage to the Merchandise Goods

Perpetrators	Quantity damaged	Damage Value (US\$ in million)	Share (%)
ENDF _EDF	26349	368.91	15.95
AFF	932	9.52	0.41
AMF	18181	561.91	24.29
EDF	38928	514.91	22.26
EDF_IRF	2196	4.44	0.19
EDF _AFF	10	1.56	0.07
EFP	32	0.29	0.01
ENDF	5636	176.80	7.64
ENDF _AFF	50	0.27	0.01
ENDF_EFP	88	0.56	0.02
ENDF_IRF	341	1.74	0.08
ENDF_EDF_AMF	4278	106.40	4.60
IRF	5427	95.54	4.13
Combined	18673	466.25	20.16
Others	6	3.93	0.17
Grand Total	121127	2313.02	100.00

Source: CITG 2022,2023

Together, these four perpetrators contribute approximately 84.38% of all damage cases, 82.33% of the quantity damaged, and 82.61% of the total damage value, highlighting their predominant role in merchandise goods destruction.

Damage values of the Machine and Machinery

The damage value of the machine and machinery consisted of the owner-perceived replacement value, the type of damage that occurred, the method of damage implemented by the perpetrators, the percentage of perpetrators involved in the damage, and the level (severity) of damage.

Damage Type

The results in Table 50 show that, overall, among 2,171 reported damage incidents affecting 1,956 units, the total damaged value is approximately US\$9.05 million, with looting dominating both in terms of the number of cases and value (Table 223).

Table 223. Type of damage to the Machine and Machinery

Damage type	Quantity damaged	Damage Value (US\$ in million)	Share(%)
Broken	104	0.26	2.87
Burned	37	0.05	0.55
Looted	1679	7.79	86.07
Missed	136	0.95	10.50
Grand Total		9.05	100

Source: CITG 2022,2023

The predominant method of damage to machinery is looting, which accounts for 87.16% of incidents (1,892 cases) and represents the largest share of damaged value at US\$7.79 million (86.07% of the total damaged value). This indicates that the forceful seize was the primary threat to machinery assets during the war. Breaking of machinery constitutes 4.84% of reported cases (105 incidents) with a damage value of US\$0.26 million (2.87%), typically caused by physical impact or handling accidents. Missing machinery accounts for 6.31% of the incidents (137 cases) and about US\$0.95 million (10.50%) in damage value. Fire or burn damage is relatively the least frequently reported, comprising 1.70% of cases (37 incidents) with the smallest monetary value of US\$0.05 million (0.55%).

Means of Damage Executions

The method of damage result demonstrates a mixed pattern where widespread looting leads in both frequency (cases) and damage value, while armed assault methods such as gunfire and artillery cause concentrated but economically significant damage (Table 224). Looting is by far the predominant method, accounting for 89.49% of damage incidents (1,945 cases) and causing about US\$7.66 million (84.68%) in damage value. This underscores forced seizure as the main threat to machinery during the war period. Using gunfire or bullet damage comprises 6.40% of events (139 cases) but results in a notable US\$1.25 million (13.83%) in damage

value, reflecting targeted armed attacks leading to substantial damage. Ground artillery bombardments contribute 2.21% of incidents (48 cases) but comparatively lower damage value (US\$0.07 million, 0.77%). Setting on fire is the least frequent method, responsible for 1.80% of incidents (39 cases) and 0.88% of the total value of damage (US\$0.08 million).

Table 224. Method of Damage employed on Machine and Machinery

Method of Damage	Quantity damaged	Damage Value (US\$ in million)	Share(%)
Gun fire/bullet	135	1.25	13.83
Ground artillery bombardments	48	0.07	0.77
Looting	1734	7.66	84.68
setting on fire	39	0.08	0.88
Grand Total		9.05	100

Source: CITG 2022,2023

Damage Severity Level

The severity of damage to machinery is overwhelmingly dominated by the highest level, with 98.34% of incidents (2,135 cases) and 98.12% of damage value (US\$8.88 million) falling within the 76–100% (complete) damage range. This indicates that the vast majority of machinery damage is total (complete) damage. Severe damage (51–75%) accounts for 1.52% of incidents (33 cases) and 1.88% of monetary damage value (US\$0.17 million), while low to moderate damage levels (26–50%) are minimal, representing only 0.14% of cases and lower damage value (Table 225).

Table 225. Level of Damage occurred to the Machine and Machinery

Level of Damage	Quantity damaged	Damage Value (US\$ in million)	Share (%)
Complete Damage	1935	8.88	98.12
Moderate Damage	3	0.00001	0.0001
Severely Damage	18	0.17	1.88
Grand Total		9.05	100

Source: CITG 2022,2023

Damage Perpetrators

As depicted in Table 226, perpetrators of the damage to machinery show that the Eritrean Defense Forces (EDF) was the leading perpetrator, accounting for 38.17% of incidents (829 cases), damaging 821 units, and causing approximately US\$2.94 million (32.49%) in damage value. Closely following are the joint forces of the Ethiopian National Defense Force (ENDF) and EDF, responsible for 32.29% of incidents (701 cases), damaging 500 units and inflicting US\$2.85 million (31.49%) in damage value. The Amhara Forces rank third, with 17.91% of incidents (389 cases), damaging 385 units, resulting in US\$1.75 million (19.34%) in damage value. The fourth largest group is the coalition of ENDF, EDF, and Amhara Forces, contributing 4.61% of cases (100 incidents), damaging 98 units, and causing US\$0.87 million

(9.61%) in damage. Collectively, these four perpetrators are responsible for over 92% of the reported damage incidents, approximately 90% of the machinery units damaged, and about 93% of the total damage value.

Table 226. Perpetrators of the damage to the Machine and Machinery

Perpetrators	Quantity damaged	Damage Value (US\$ in million)	Share (%)
EDF_AMF	68	0.50	5.52
AMF	385	1.75	19.34
EDF	821	2.94	32.49
ENDF	59	0.07	0.77
ENDF_EDF	500	2.85	31.49
ENDF_EDF_AMF	98	0.87	9.61
IRF	25	0.07	0.77
Grand Total		9.05	100

Source: CITG 2022,2023

Loss by category

The trade sector in Tigray has suffered an estimated total loss of about US\$12.08 billion from 2021 to 2023, attributable to war, blockade, and siege. This amount is divided into three primary categories - sales (revenue) loss, loss from additional costs, and loss from forgone values (Table 227).

Table 227. Loss Value of the Trade sector (US\$ in Million)

Main Category	Sub-Category	Loss Value (US\$ in Millions)	Share (%)
Sales (Revenue) Loss	Revenue loss from 2021 to 2023	6900.00	57.11
Loss due to Additional Costs	Increase in purchase price	89.93	42.13
	Rented items, repair/maintenance, & other expenses	4999.74	
Loss due to Forgone Value	Forgone project budgets	62.91	0.76
	Forgone bids (contracts)	28.65	
Total Loss Value		12081.23	100.00

Source: CITG 2022,2023

The trade sector in Tigray sustained a catastrophic total estimated loss of approximately US\$12.08 billion between 2021 and 2023, primarily driven by the consequences of the war, blockade, and siege. The most significant component of this loss is the Sales (Revenue) Loss, valued at US\$6.90 billion, which accounts for a dominant 57.11% of the total. This direct loss of forgone revenue is a stark indicator of the complete collapse of regular commercial activity and the severing of the trade supply chain due to severe movement restrictions. The estimation of this revenue loss relies on a robust methodology, using an average or trend from pre-war years (2018-2020) to establish a baseline, thereby mitigating the distorting effects of the 2020 COVID-19 pandemic and other pre-war instability. The massive US\$6.90 billion revenue loss signals a deep-seated liquidity crisis within the trade sector. Businesses have been stripped of

retained earnings and essential working capital, meaning they are fundamentally unable to restart operations without external aid. Consequently, recovery efforts must prioritize financing mechanisms, such as grants or subsidized loans, specifically targeted at restoring basic working capital, rather than just focusing on replacing damaged physical assets.

The second major category is the Loss due to Additional Costs, totaling approximately US\$5.09 billion. This figure demonstrates that the sector was operating under extreme duress, with operational expenses surging even as revenue was suppressed. The bulk of this cost (US\$4.9997 billion) is attributed to rented items, repair/maintenance, and other necessary expenses, including significant outlays for emergency repairs and humanitarian support for employees and the community. Furthermore, a US\$89.93 million increase in purchase price costs reflects the intense inflationary pressure and scarcity premium paid for essential goods amid supply chain disruptions. Furthermore, the US\$5.09 billion in additional costs presents a major challenge. The size of this figure, particularly the humanitarian component, indicates a severe burden-sharing shift where businesses were forced to bear essential societal costs during the conflict. To prevent immediate business failure when operations resume, this necessitates targeted debt relief or compensation for the incurred expenses. Separately, the increase in purchase prices highlights the sector's acute vulnerability to imported inflation, demanding immediate policy intervention to stabilize supply chains and control the cost of essential commodity imports.

Finally, the Loss due to Forgone Values, while the smallest component at approximately US\$91.56 million or 0.76 % of the total, is profoundly important. This loss, composed of forgone project budgets (US\$62.91 million) and bids/contracts (US\$28.65 million), represents a direct measure of canceled investments and foregone future commercial opportunities caused by the pervasive insecurity and economic shutdown. While numerically the smallest component, the loss of contracts and budgets (Forgone Values) has the critical long-term implication of eroding investor confidence and hampering economic diversification. Therefore, recovery strategies must include mechanisms to signal stability, such as sovereign risk guarantees and public-private partnership facilitation, to regenerate the vital pipeline of investment projects and restore the sector's long-term growth trajectory. In sum, the trade sector in Tigray faces not merely a temporary halt but a fundamental structural reset that demands a multi-pronged recovery strategy addressing working capital, debt relief, inflation control, and investor confidence restoration simultaneously.

Impact of the war

Unpaid Loan: The result shows that 5,919 (five thousand nine hundred nineteen) firms had taken loans and failed to repay their outstanding loans as a direct consequence of the war and siege. The inability to repay these loans was primarily driven by a combination of factors, including significant loss of assets and resources suffered by businesses, severe disruptions to revenue streams, and the broader economic devastation caused by the ongoing war and imposed siege conditions. These challenges have critically undermined the financial capacity of borrowers, limiting their ability to meet loan obligations and exacerbating the economic crisis faced by affected firms.

Unpaid salary and allowance: From the surveyed firms, a total of US\$13,936,838 in salary and benefits of their respective employee were not paid by the firms. This figure is the summation of the two years (2021, 2022) principal salary and allowance. This salary was not paid by a normal budget like the public sector. However, this unpaid salary is treated in this separate section to show that firms have this much obligation for their respective employees due to the war and siege. Hence, firms have to be compensated for this, as this obligation was incurred due to the impact on them, so that they did not pay the salary to their employees accordingly.

Labor Loss: The results from the assessed firms have shown us that 204 were dead, **291** were injured/wounded, and 28 were reported to be missing

2.5.3 Conclusion and Recommendation

Conclusion

The Tigray war caused severe damage to the region's trade sector, undoing years of economic growth and destroying a once-successful commercial network. Before the war, Tigray's trade was a key driver of macroeconomic development, significantly contributing to GDP, tax income, and jobs. The region was modernizing its trade, boosting exports, and integrating more with national and global markets. Tigray's firms were crucial in delivering goods and services, reflecting a dynamic and growing economy. Survey data from 2012 E.C. highlights the importance of Tigray's pre-war economy: export values reached about US\$7.95 billion, and tax revenues were US\$18.68 million, shared between regional and federal governments. These figures emphasize the sector's broader role.

The war and a total siege violently halted this progress. The blockade cut off trade routes, stopped business activities, and caused market access to collapse. Livelihoods were destroyed, and development gains erased. The blockade was a deliberate strategy, weaponizing economic isolation and violating international and humanitarian laws. Damage was felt across all areas, with urban centers suffering most due to their concentration of businesses and infrastructure.

The devastation affected above 30,000 firms. Sole proprietors made up 98.9%, and micro enterprises—over 93%—were particularly vulnerable. Most relied on self-funding, with little access to loans or external aid, leaving them exposed to war shocks. Post-war operation data shows many firms closed or operated at much reduced capacity, often below half of pre-war levels.

Severity: Overwhelming prevalence of complete damage across firms and zones

Top perpetrators: ENDF, EDF, AMF, and their joint operations

Widespread physical destruction included Building, Vehicle, Fixed equipment, Office Furniture, Electrical equipment, ICT equipment, Imported Goods in transit, consumables and finished goods, Dangerous Chemicals, Waste disposal equipment, Merchandise Goods, and machinery. The total economic effect exceeds US\$35.7 billion, with damage (physical destruction) making up nearly two-thirds. The scale and intent of the destruction confirm that the trade sector in Tigray was not merely disrupted—it was systematically dismantled. The prevalence of complete damage across firms and zones underscores the deliberate nature of the

assault. According to the assessment, the most severe impacts were concentrated in areas targeted by ENDF, EDF, AMF, and their joint operations. The sector was not just disrupted but systematically dismantled. Recovery will require more than rehab; it demands comprehensive reconstruction, institutional support, and justice to address the scale and intent of the destruction. Looting and vandalism worsened the losses, and lack of insurance or financial reserves deepened the crisis. Employment was severely affected, with many layoffs. The region lost skilled workers due to death, injury, disappearance, or displacement, weakening its economy.

Supply chains—local and cross-border—failed completely. Firms lost access to raw materials, inputs, and markets, while informal trade networks disintegrated. Formal channels became non-functional due to insecurity and transport blockades. This led to severe shortages and sharp price increases, as confirmed by traders and market comparisons. These conditions resulted from a calculated blockade by the Ethiopian Federal Government to isolate Tigray economically.

In summary, the Tigray war represents an unprecedented attack on the region's economic foundation. The targeted destruction of trade infrastructure and strategic blockade turned a vibrant commercial sector into ruins. Rebuilding will need coordinated efforts, substantial investments, and a focus on restoring infrastructure, community dignity, and resilience.

Recommendation

The extensive destruction in Tigray's trade sector requires a comprehensive, multi-level recovery plan that addresses both immediate needs and long-term rebuilding. The loss of productive capacity has caused economic and fiscal setbacks, increased unemployment, reduced household incomes, and sharply decreased tax revenues, which are critical for public services. These ripple effects have strained regional and national budgets, compromising food security, industrial activity, and supply chains across the region.

To effectively counter these impacts and restore economic stability, efforts must be coordinated among local, national, and international stakeholders. Domestically, regional and federal authorities should focus on rehabilitating essential infrastructure like transport, markets, and utilities that facilitate trade. Support for affected businesses, especially micro and small enterprises, which are vulnerable, is crucial. Such support includes debt relief—such as debt waivers and interest relief—and access to affordable financing to rebuild working capital.

Recovery strategies should strike a balance between short-term actions—restoring basic functions and livelihoods—with long-term objectives, such as rebuilding the trade ecosystem and enhancing resilience. This involves re-establishing supply chains, rebuilding inventories, and investing in digital and logistical infrastructure to modernize trade. Programs should be tailored to the needs of affected firms, with in-kind aid (such as replacement of machinery, inventory, and vehicles) often being more effective than cash transfers.

International donors and development agencies play a vital role. Their support, including grants, concessional loans, and procurement of replacement assets, is essential. Capacity-building initiatives, like training displaced and unemployed workers, will speed recovery and promote inclusive growth.

Finally, recovery efforts must be accountable and just. Identifying key perpetrators and acknowledging the systematic nature of destruction requires legal and institutional mechanisms that recognize harm and protect community rights. Without such measures, rebuilding risks superficiality and unsustainability.

Overall, restoring Tigray’s trade sector is both a vital economic goal and a moral responsibility. A coordinated, inclusive, and adequately funded recovery plan is critical to restoring livelihoods, rebuilding trust, and developing a resilient, equitable future.



Finance Sector



2.6 Damage and Loss to Finance

2.6.1 Pre-war Context

According to Global Facility for Disaster Reduction and Recovery Need Assessment Guideline (GFDRR-Volume A, 2013), pre-disaster (pre-war) baseline data is critical to determining the overall impact of the disaster across all sectors, including its impact on human development. Baseline data also contributes to the vulnerability analysis and towards an understanding of the underlying causes of the disaster. That in turn contributes to planning an effective and resilient recovery.

This guideline indicates that sector teams gather data on pre-disaster baseline conditions pertinent to their sector. Furthermore, it allows that in case where the baseline data is not available in the census, sector or local surveys or sector and disaggregated reports, it may be necessary to estimate a baseline data on the basis of discussion with key informants, determining baseline data on the basis of visual impressions of unaffected areas and its comparison with the affected areas. In certain situations, where satellite imagery of pre-disaster situations is available, these images could be interpreted to develop sector-wise baseline data.

This section provides baseline data related to pre-war context of the Finance Sector. The data was used to make initial assessments so as to establish a basis for estimating impacts of the Tigray war on the sector

Status of Finance Sector in Ethiopia

Access to bank services has demonstrated fast improvement over recent years. By 2020, the commercial banks were operating in 6,511 branches across the country. As a result, branch to population ratio stood at 1:15,702 people¹⁶ in 2019/20, a spectacular outreach growth compared to 1:1,857,542 people in 2003/4 (NBE, 2019/20). Another remarkable progress of the financial sector is a paradigm shift from public bank to private one and de-concentration of financial services from provincial administrative urban centers to *Wereda* rural towns/emerging towns.¹⁷

According to 2021/22 annual report of National Bank of Ethiopia (NBE), banks, insurance companies and microfinance institutions are the major financial institutions operating in

¹⁶CSA Population Projection for 2019/20 was 102,235,000.

¹⁷ Note that of the total 6,511 number of bank branches, the private bank branches constituted a lion's share (70.5 percent) in 2019/20. The state-owned DBE also opened 107 branches across the country in 2018/19. In terms of capital, 50.8 percent constitutes public banks vs. 49.2 percent total private banks (NBE, 2019/20).

Ethiopia. At the end of June 2021/22, the number of banks reached 30, insurance companies 18 and microfinance institutions 43.

This report indicated that banks opened 1,600 new branches in 2021/22; thereby raising the total number of branches to 8,944 from 7,344 a year ago. As a result, population to bank branch ratio reached 12 thousand people per branch. At the same time, total capital of the banking industry showed a 31.7 percent annual growth to reach US\$ 3.52 billion.

On the other hand, the number of insurance companies remained at 18 with their branch network increasing to 690 following the opening of 55 new branches in 2021/22. About 55.4 percent of insurance branches were operating in Addis Ababa and 86.8 percent of the total branches were private. Their total capital grew at 20.9 percent to US\$ 0.24 billion, of which, the share of private insurance companies stood at 74.8 percent while that of the state-owned insurance company was 25.2 percent.

By end of 2021/22, the number of microfinance institutions reached 43. Their overall performance was encouraging as their total capital and total asset increased by 68.2 and 24.6 percent to reach US\$ 0.27 billion and US\$ 1.04 billion, respectively. At the same time, their deposit mobilization and credit facility also expanded remarkably. Compared to previous year (2020/21), their deposit went up by 16.6 percent and reached US\$ 0.50 billion while their outstanding credit increased by 22.2 percent to US\$ 0.65 billion indicating their expanded outreach.

Resource Mobilization: Total resources mobilized by the banking system in the form of deposit, borrowing and loan collection during 2021/22 increased by 24 percent and reached US\$ 11.07 billion. Of the total deposits, saving deposits accounted for 59.6 percent and demand deposits and time deposit account for 33.3 percent and 7 percent, respectively.

New Lending Activities: In 2021/22 banks disbursed US\$ 7.56 billion in fresh loans which was 29.9 percent higher than a year ago. Outstanding credit of the banking system (including corporate bond) increased by 23.9 percent and reached US\$ 28.27 billion at the end of June, 2022.

Status of Financial Institutions in Tigray

The financial institutions operating in Tigray consists of formal, semi-formal and informal institutions. The formal financial system is a regulated sector which comprises of financial institutions such as banks, insurance companies and microfinance institutions. Formal financial sector includes, commercial banks (owned by private and public), Development Bank of Ethiopia (DBE), credit and savings cooperative, insurance companies (both public and private) and microfinance institutions.

The deposit taking financial sector operating in Tigray comprises two government owned banks (Development Bank of Ethiopia and Commercial Bank of Ethiopia), 17 private commercial banks and three microfinance institutions, namely Dedebit Microfinance, Adeday Microfinance, and Lideta Microfinance, in addition to more than 900 Savings and Credit Cooperatives (SACCOs).

In order to collect the baseline information or status of the sector before the war, extent of the war, amount of damage occurred in the infrastructure and physical assets, and loss the financial institutions incurred as the result of war, the team distributed structured questionnaire (checklist) to banks, insurance companies and microfinance institutions in August 2022. However, regardless of the other parts, data related to baseline information was not complete. To address this gap, the assessment team convened meetings with the heads of the institutions to discuss the significance of the data and their expected commitment. Finally, a revised questionnaire was developed to collect data regarding their status both before and after the war. Consequently, the team distributed this revised questionnaire to 18 banks, 18 insurance companies and two microfinance institutions. Although the team successfully gathered complete information from 12 banks and 2 microfinance institutions, the data obtained from 6 banks was not complete.

The respondent banks represent those large banks in terms of branch and customer, outreach (estimated about 70-80 percent), and geographic operational coverage. On the other hand, the insurance companies did not respond regardless of the team's repeated visits and telephone calls to collect the data.

The baseline information regarding the banks and MFIs involved is presented in the following sections. The team gently reminds readers that while the banks functioning in Tigray are branches and their financial and non-financial performance reports are compiled at their respective Head Offices in Addis Ababa, the data presented below reflects the operational

results of the banks in Tigray. In fact, majority of the respondent banks have regional coordinating offices, known as districts, where their operational performances are documented, in Mekelle city.

Baseline information of Banks in Tigray

This section provides an overview of the baseline information regarding the banks operating in Tigray. For the purpose of collecting baseline information the financial institutions were requested to fill a structured questionnaire that contains mainly outreach in terms of branch networks, status of resource mobilization (deposit), loan disbursement status, profitability condition, credit loss, and additional costs.

Outreach of banks

Outreach refers to the ability of a bank and an MFI to provide high quality financial services to large number of clients. In order to examine their outreach the banks were asked to indicate their number of branches, number of deposit customers and loan customers. Accordingly, it was discovered that the 12 banks that responded had been providing different financial services to the large population of Tigray before the war. These banks had 495 branches to serve 10,960 loan customers and 3,547,043 deposit customers.

Resource mobilization status of Banks

The banks provide three types of deposit products: savings deposit, demand deposit, and time deposit (see the following table). On average, the banks had been mobilizing annual deposits of US\$226.76. Out of this average deposit, the savings deposit comprises more than 80.3 percent (US\$182.04), while the share of the Demand deposit is 12.16 percent, followed by the time deposit at 8% (Figure 16). Moreover, more than 70 percent of this deposit came from three banks, Commercial Bank of Ethiopia, Wegagen Bank, and Lion International Bank, with deposits of US\$89.57, US\$42.13, and US\$33.51, respectively.

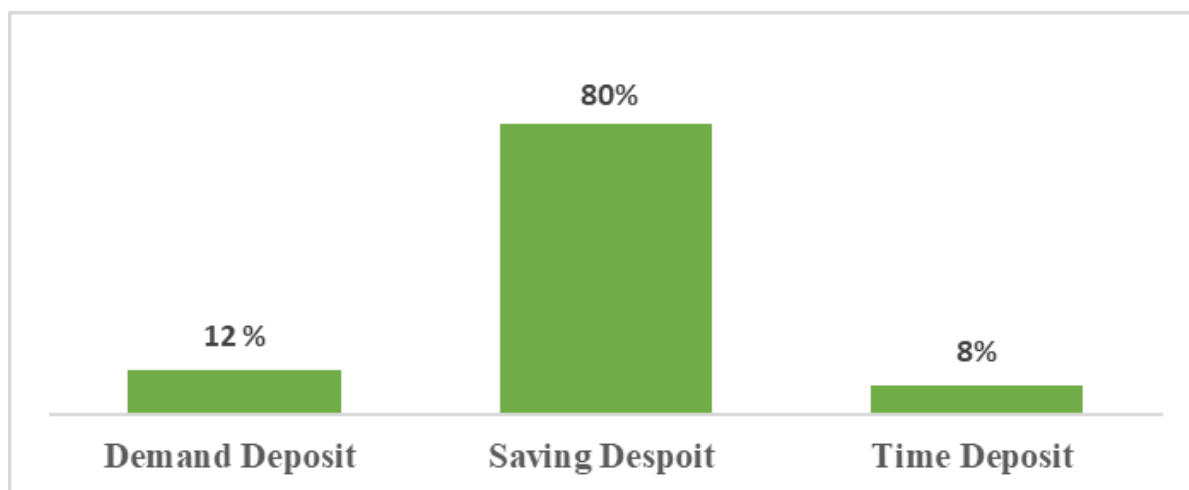


Figure 16: Type of Annual Deposit in Proportion
Source: CITG Survey, 2022

Loan Disbursement of Banks

The average annual loan disbursement of the banks was US\$126,294,692.58 before the war. With regard to the total balance of outstanding loans, the banks had US\$391,614,382.69 total outstanding loans on October 30, 2020, disbursed to 10,961 loan customers (Table 128). It is necessary to note that this figure is the sum of the total unpaid balance of principal amount and the accumulated amount of interest.

Table 228. Loan Disbursement Status of Banks in Tigray before the War

Description	Aggregate as of June 30, 2020
Amount of average annual loan Disbursement before the war	US\$ 126,294,692.58
Total Amount of outstanding loan before the war	US\$ 391,614,382.69
Number of loan Customers	10,961

Source: CITG Survey, 2022

Comparing the total deposits to total loan disbursements mentioned earlier, it can be inferred that from the total deposit amounting to US\$1,144,476,386.59 reported on October 30, 2020, only US\$391,614,382.69, which constitutes about 34 percent of the total resources mobilized from the Tigray community, was allocated to businesses and individuals within Tigray. The remaining balance, representing 66% of the deposit, was transferred to their respective Head Offices in Addis Ababa for disbursing to other business entities outside of Tigray. This shows that banks operating in Tigray have made a significant contribution to the financial needs of the entire banking sector in Ethiopia, despite being severely impacted by the war.

Profit and loss Status of banks in Tigray

War (armed wars) can have a direct or indirect impact on an economy. The first group includes the costs of destruction of physical capital, costs of damage to infrastructure, and expenditures provided for displaced and injured people. Indirect costs refer to forgone investments, income reduction due to damaged physical capital, and reduction of human capital, as well as reduction of income borne by tourism.

War results in economic and political instability, which can indeed be associated with a greater risk of systemic banking crisis. Conflicts can lead to banking crises. These include lower economic growth, higher non-performing bank loans, lower bank deposits and liquidity, reduced profitability or greater losses (lost income). War results in higher credit loss, which ultimately lowers the profitability of the war-affected financial institution. Credit risk is the probability of a financial loss resulting from a borrower's failure to repay a loan. Essentially, credit risk refers to the risk that a lender may not receive the owed principal and interest, which results in an interruption of cash flows and increased cost for collection, which ultimately reduces the profitability of the affected bank.

For this purpose, the banks operating in Tigray were requested to indicate the effect of the war on their performance, mainly on profit (loss), credit risk, lost profit due to the war and siege, and any additional costs incurred. An analysis of the data collected from the respondents is presented in the following sections.

Profit (loss) of the banks before the war

The information gathered from the respondent banks does not explicitly state the operational results of the participating banks, as their financial statements are compiled at the head office level, and the contribution of individual branches are not specified in the statements. Nevertheless, the assessment team recognizes that the banking sector in Ethiopia has been significantly profitable, and although not explicitly documented, the banks in Tigray have also achieved operating profits. Therefore, the war has had a tremendous impact on the profitability of these financial institutions.

Non-performing Loan or expected credit loss

This refers to the probability of a financial loss resulting from a borrower's failure to repay their loan. Essentially, credit risk refers to the risk that a lender may not receive the owed principal and interest, which results in an interruption of cash flows and increased costs for

collection. The credit loss or non-performing loan before the war was US\$2,665,620.83, which is below one percent of the total outstanding loan of US\$391,614,382.69 reported on June 30, 2020, much lower than the 5% non-performing loan ceiling of the National Bank of Ethiopia. This suggests that banks in Tigray were effective and efficient in maintaining sound banking practices.

Baseline Information of MFIs in Tigray

The microfinance institutions focus on providing savings, credit, and other financial services to the poor and lower-income groups of society who have limited access to commercial banks, in order to reduce poverty and to help them with setting up their own income-generating businesses. MFIs originate with a dual mission that combines social (outreach to the poor) and commercial (financial sustainability) objectives. The social mission seeks to provide financial services to as many of the lowest-income population as possible. On the other hand, the financial objective drives MFIs to achieve financial self-sufficiency, which allows sustainable service delivery without dependence on subsidies.

The MFIs are the main financers of MSEs in Tigray, as the credit policies of commercial banks often limit, if not exclude, MSEs for a couple of reasons. Firstly, the credit policies of commercial banks make fixed asset collateral mandatory. Secondly, commercial banks tend to be unaccommodating towards MSEs; even when some MSEs are prepared to provide a fixed assets guarantee, the lending procedure is lengthy. In other words, commercial banks take an extended period to evaluate a borrower's profile, which typically prevents MSEs from seizing available opportunities. Thirdly, commercial banks perceive financing MSEs as unprofitable due to the small size of the loans, which results in a high transaction cost per unit of loan (Haftu, Tsehaye, et. al., 2009).

The subsequent sections offer a summary of the baseline information pertaining to the MFIs operating in Tigray.

Outreach of MFIs:

Outreach, which refers to the capacity of a financial institution to deliver high-quality financial services to a substantial number of clients, serves as a social goal for MFIs. This objective is focused on enhancing the welfare of the poor and lower-income segments of society that are often overlooked by commercial banks. The outreach of the two major MFIs functioning in Tigray (DECSI and AMFI), as detailed below, indicates that they have extended deposit

services to 1,437,794 clients and credit services to 365,573 clients. This implies that, assuming the population of Tigray is 6 million, it can be inferred that they have successfully offered deposit services to 24 percent of the society, while their credit outreach stands at 6 percent.

Table 229. Outreach of Microfinance Institutions in Tigray

Description	Data before the War (as of June 30, 2020)
Total number of Branches	206
Number of Loan Customers	365,573
Number of Deposit Customers	1,437,794

Source: CITG Survey, 2022

Saving Mobilization of MFIs

Like any other MFIs in Ethiopia, savings mobilization is a central activity of DECSI and AMFI. Large part of resource of these institutions is mobilized from households' disposable income, business (corporate) savings, investment earnings, and government deposits.

Depositors have the option to save either “as they go” or in a “planned” approach. In the former saving method, clients are allowed to deposit any amount of money at their convenience, while in the latter, depositors or borrowers enter into an agreement to deposit a predetermined sum of money over a specified timeframe, which could be weekly, bi-weekly, monthly, quarterly, biannually or annually. The compulsory deposits, for example, are planned deposits. Data reveals that since 2016, due to the introduction of the Low-Cost Housing Development Project in the Region, planned deposit saving modality has become a significant source of fund for DECSI, followed by saving accounts deposit. Planned deposit enables the institution to predict its cash flow and to design a realistic loan plan.

Data indicates that DECSI and AMFI have successfully raised a significant sum of money from their clients. For example, they accumulated a total deposit of US\$ 38,749,448.28 during the 2019/2020 budget year. Conversely, the total outstanding loan for DECSI and AMFI as of June 30, 2020, amounted to US\$ 194,434,987.43, which was sourced from 1,437,794 clients.

As per the damage and loss report from DECSI, the institution raised a total of US\$ 45,545,381.24 from 988,759 saver clients as at the 2015/16 budget year. By the 2019/20 budget year, this deposit had risen to US\$ 185,431,651.01, sourced from 1,329,923 clients, indicating a four-fold increase in savings and approximately a 35 percent rise in the number of depositors. Female savers contributed to 35.7 percent of the total active savers and about 18 percent of the total amount of savings in 2019/20.

The assessment team presumes that the factors contributing to the consistent growth in savings within the institution may include the rise in disposable income among Tigrayans, attributed to the improved economic performance of the Region; the growing number of sub-branches and microfinance offices; individuals' inclination to deposit funds for security purposes; and the enhanced saving culture within society, all of which are thought to positively influence the effectiveness of deposit mobilization.

Table 230. Deposit Mobilization Status of MFIs in Tigray before the War

Description	Aggregate as at June 30, 2020	Share(%)
Annual Saving Deposit (US\$)	36,773,514.38	95
Annual Demand Deposit (US\$)	895,343.82	2
Annual Time Deposit (US\$)	1,080,590.08	3
Total Annual Deposit (US\$)	38,749,448.28	100
Total outstanding Deposits (US\$)	194,434,987.43	
Number of Deposit Customers	1,437,794	

Source: CITG Survey, 2022

Loan Portfolio of MFIs

Providing loan is another core activity of DECSI and AMFI because it mainly makes business by lending. As at June 30, 2020, four months before the war on Tigray was launched, DECSI alone used to provide 18 loan product services, which include about 156 different economic activities: 21 Agriculture; 27 Manufacturing; 49 Trade; 53 Services; 4 Construction sector; and 2 personal uses (DECSI Planning Department, 2022). The institution gives priority to these economic sectors because their impacts on poverty reduction, job creation, local economic development, wealth creation, and economic linkages are enormous.

Regarding the loan disbursement, the institution has achieved remarkable progress. The loan amount increased from US\$ 17,201,027.83 in 2009/10 to US\$ 91,852,516.45 in 2019/20. DECSI receives several soft loans (WEDP, RUFIP, and renewable energy) from the World Bank through the DBE and subsequently lends these funds to its clients.

DECSI and AMFI, like any other MFIs, carry out both non-collateral and collateral based loan mechanisms. The Federal Proclamation No. 40/1996 Art.15 necessitates MFIs to use a solidarity group lending mechanism, by forming a syndicate of 5 to 7 members; which is later reduced to a syndicate of 3-5 individuals. Such a mechanism serves as an alternative form of collateral. Group guarantee is believed to be an effective borrowing mechanism to co-guarantee each other's loans and it enables poor people to borrow from MFIs.

The assessment team determined that the average annual loan disbursement over the five years preceding the war (from June 2016 to June 2020) amounted to US\$ 30,915,293.88, distributed among 365,573 loan customers, resulting in an average of US\$ 84.57 per customer. Typically, MFIs offer small loan amounts to a vast number of MSE operators and individuals, whereas banks provide substantial credit amounts to a limited number of loan clients. This distinction can be illustrated by comparing the loan disbursement figures of MFIs with the loan outreach of banks, as discussed in the preceding sections. While MFIs disbursed a total of US\$ 30,915,293.88 to 365,573 customers, averaging US\$ 84.57 per customer, banks issued loans amounting to US\$ 73,291,159.01 to only 6,745 loan customers, resulting in an average loan of US\$ 10,866 per customer.

The financial reports of DECSI highlight agriculture as a fundamental economic pillar of Tigray, particularly regarding its contribution to GDP, provision of livelihoods, and income generation; it constitutes the majority of DECSI's overall disbursement. Analyzing the average loan disbursement over the last five years (2015/16 to 2019/20), out of the annual average loan amounting to US\$ 61,298,171.25, 31.23 percent was allocated to the agriculture sector, followed by the construction sector, which includes the Low-Cost Housing Development Project (27.11 percent), trade (22.89 percent), service (9.83 percent), manufacturing (5.42 percent), and other sectors (3.52 percent). The team has gained insights from the aforementioned data and the FGD indicating that DECSI has been instrumental in establishing a dynamic MSE-oriented economic organization in both urban and rural areas of Tigray.

Financial performance (profit and loss) of MFIs

As outlined in the baseline of banks section of this report, losses are defined as disruptions to financial flows caused by war or disaster. In this assessment, losses pertain to services that are not provided during a specific timeframe, which extends from the onset of the war (November 4, 2020) until complete recovery and reconstruction are accomplished. Considering the five years preceding the war (June 2016 - June 2020) as a reference, DECSI and AMFI managed to achieve an average annual profit of US\$2.35 million. This demonstrates that the institutions have progressed towards achieving financial self-sufficiency, enabling them to provide sustainable services independently of subsidy sources, including donations.

The loss from bad debts or credit risk, referred to as non-performing loans by the National Bank of Ethiopia, was reported to be US\$2.58 million, resulting in a non-performing loan ratio of 1.36 % (calculated as US\$2.58 million expected credit loss as of June 2020 divided by US\$

189.22 million of total outstanding loans as of June 30, 2020) (Table 231). This indicates that their effective and efficient credit management allowed the institutions to maintain a significantly lower non-performing loan rate than the maximum limit of 5% established by the NBE.

Table 231. Deposit Mobilization Status of Banks in Tigray before the War(US\$ in Millions & Number)

Description	Aggregate as of June 30, 2020	Percent
Annual Saving Deposit(US\$)	182.04	80.28%
Annual Demand Deposit(US\$)	27.57	12.16%
Annual Time Deposit(US\$)	17.14	7.56%
Total Average Annual Deposit(US\$)	226.76	100.00%
Total Deposits (Accumulated Deposit)(US\$)	1,144.48	
Number of Deposit Customers (Number)	3,547,043.00	

Source: CITG Survey, 2022

2.6.2 Results

Respondent Profile

The respondent profile for this Damage and Loss Assessment (DaLA) report encompasses the entirety of the formal financial sector operating within the Tigray Regional State. This comprehensive profile includes 18 public and private banks that maintained branch networks across the region, ensuring full institutional coverage of the commercial banking infrastructure. Crucially, the assessment also rigorously incorporates data from the two principal microfinance institutions (MFIs) active in the area: Dedebit Microfinance Institution and Adeday Microfinance Institution, including all their respective branch networks located throughout Tigray. For additional information, refer to Table 232 and Table 233 provided below. This inclusive approach provides a holistic baseline for evaluating the exposure, damage, loss, and impact across both large-scale commercial operations and vital micro-level financial services.

Table 232. Respondent Bank Branches Categorized by Zone

Bank Name	Respondent Bank Branches by Zone						Total
	Central	Eastern	Mekelle	North Western	Southern	South Eastern	
Development Bank of Ethiopia	3	2					5
Commercial Bank of Ethiopia	20	9	3	9		4	45
Lion International Bank S/C	11	17	2	11	3	3	47
Bank of Abyssinia S/C	5	10	1	4		1	21
Wegagen Bank S/C	6	14	2	10		1	33
United Bank S/C	1			2			3
Dashen Bank S/C	1	4	1				6
Bunna International Bank S/C	1	2					3
Cooperative Bank of Oromia S/C	1	1					2
Awash International Bank S/C		2		1			3
Enat Bank S/C		1		1			2
Zemen Bank S/C		1		1			2
Debub Global Bank S/C		1					1
Nib International Bank S/C		2					2
Addis International Bank S/C		1					1
Abay Bank S/C		3					3
Oromia International Bank S/C		2					2
Berhan International Bank S/C		1		1			2
Total	49	73	9	40	3	9	183

Source: CITG Survey, 2022

Table 233. Respondent MFI Branches Categorized by Zone

MFI Name	Respondent MFI Branches by Zone							Total
	Central	Eastern	Mekelle	North Western	Southern	South Eastern	Western	
Dedebit Credit and Savings Institution S/C	38	26	5	30	14	13	21	147
Adeday Microfinance Institution S/C	5	5	3	4	1	2	3	23
Total	43	31	8	34	15	15	24	170

Source: CITG Survey, 2022

Damage to the Bank

Damage to Buildings and Building Infrastructure

The assessment team examined the amount of damage sustained by the bank buildings, with a specific focus on the Commercial Bank of Ethiopia (CBE). Information was collected from the bank via a field survey. CBE owns 21 buildings in Tigray; however, three of these buildings were excluded from the field assessment due to accessibility issues, as they are situated in Western Tigray. Among the remaining buildings, war-related damage was noted in seven buildings located in the Eastern, Central, and North Western zones of Tigray.

The total damage for each item was determined using a bill of quantities (BOQ) to facilitate the management of the unit price for each item. The total damage is represented in monetary terms based on the replacement cost of each damaged item (World Bank, 2010; United Nations, 2014). The replacement costs considered in this study prevailed during the period of January to February 2022.

Replacement Cost of Damaged Buildings: In the process of damage assessment, it is essential that the current replacement costs for damaged items are substantiated by the market price. To achieve this, in accordance with the stipulations of the International Valuation Standards (IVS, 2017) and the damage and loss assessment guidance note, Volume 2 (World Bank, 2010), the current unit price for the majority of items was gathered from three contractors¹⁸ during the period of January to February 2022, and the average was utilized for the calculations. Consequently, the total damage amount for the seven affected buildings of the CBE is US\$ 0.66 million (Table 234).

¹⁸The unit price collected from the contractors did not include VAT.

Table 234. Estimated Damage Amount for Affected Bank Buildings (US\$ in Millions)

Location	Zone	Total Damage (US\$ million)	Share (%)
Adigrat branches	Eastern	0.02	3.26
Wukro branches	Eastern	0.01	2.01
Axum branches	Central	0.00	0.09
Adwa branches	Central	0.01	1.52
Shire District	North Western	0.07	9.86
Shire Resident branch	North Western	0.01	1.95
Sheraro branches	North Western	0.54	81.31
Total		0.66	100.00

Source: CITG and Market data, 2022

Damage Type

During the field visit, it was observed that certain buildings experienced significant damage due to fire and/or explosions; additionally, in other buildings, there was intentional breakage of doors and windows by the perpetrators. In almost all buildings, bullet shooting at the glazing structure from a near distance and breaking doors and windows for looting purposes was common. Nevertheless, the building at the Sheraro branch was entirely destroyed as a result of an intentional fire that lasted for more than 10 days. The extent of the damage observed in the Sheraro branch is both distinctive and grave, as every component within the building was melted and utterly annihilated.



Fire Damage to CBE Building – Sheraro Branch (2022) The internal surfaces and roof of the Commercial Bank of Ethiopia (CBE) building in Sheraro sustained extensive fire damage, severely compromising structural integrity and service continuity. Source: CITG Survey (2022)

Table 235 indicates the type of damage that buildings of the CBE branches faced. It was presented that looting is recorded as the leading cause of damage, accounting for 71.4% of the bank buildings. Additional methods used to damage the structures consist of intentional burning and deliberate shelling, each contributing 14.3%.

Table 235. Types of Damage Execution, Bank Buildings (US\$)

Types of Damage Execution	Damage Value (US\$)	Share (%)
Looted	471023.6294	71.40
Burned	94336.66528	14.30
Distraction	94336.66528	14.30
Total	659696.96	100.00

Source: CITG Survey , 2022

The recorded damage to bank buildings, which is directly associated with looting and setting fire initiated by particular state actors, represents not only physical devastation but also a calculated attack on essential economic infrastructure, carrying significant consequences for the livelihoods and future of the Tigrayan population. The occurrence of shelling or gunfire amidst the looting indicates that the event was not a passive incident, but instead an active and frequently violent one.

Damage Severity level

Table 236 indicates the financial impact and distribution of damage across three severity levels, totalling \$0.66 million (US\$) in estimated damage value. The majority of the reported loss stems from moderately damaged assets, which account for a substantial \$0.47 million. This category represents the overwhelmingly largest share of the damage, at 71.4%. The remaining damage is split equally between the other two classifications. Both the Minor Damaged and Complete Damage categories recorded an identical damage value of \$0.09 million each. Consequently, both of these categories contribute an equal share of 14.3% to the total financial damage.

Table 236. Damage to Building and Building parts by Damage Severity Level (US\$ in Millions)

Damage severity Level	Damage Value (US\$)	Share (%)
Moderately Damaged	0.47	71.4
Minor Damaged	0.09	14.3
Complete Damage	0.09	14.3
Total	0.66	100

Source: CITG Survey, 2022

In summary, the assessment demonstrates that the damage inflicted on buildings was highly severe, characterized predominantly by complete loss rather than repairable minor or moderate damage.

Damage Perpetrators

It has been documented by various UN agencies, research institutions such as Ghent University, the World Peace Foundation, and the International Crisis Group (ICG), human rights advocacy organizations including Human Rights Watch and Amnesty International, as

well as independent international media outlets like CNN, Al Jazeera, and the BBC that numerous parties have participated in the war in Tigray.

In this context, **Error! Reference source not found.** reveals that the Eritrean Defense Forces (EDF) were the predominant actors responsible for the documented damage to building assets, accounting for 71% of the total. In comparison, the Ethiopian National Defense Forces (ENDF) were responsible for the remaining 29% of the damage. This disparity in the share of responsibility indicates that the EDF had a significantly greater involvement in the destructive acts against this infrastructure than the ENDF, with their share being more than double that of the national forces. This pattern suggests a complex war dynamic where both key military actors contributed to the targeting of economic infrastructure, but the EDF was clearly the primary force behind the documented destruction (**Error! Reference source not found.**).

Table 237. Banks Building Damage by Perpetrators (%)

Perpetrator	Share (%)
EDF	71
ENDF	29
Total	100.00

Source: CITG Survey 2022

Construction Consultancy Costs

Normally, professional consultancy services are necessary when construction or reconstruction projects are initiated. Concerning the damaged buildings of CBE, it is suggested that reconstruction be carried out for those that are completely damaged, while maintenance is recommended for the structures that are partially and slightly damaged. These activities must be overseen by a private consultant. The costs associated with consultancy are classified as direct costs resulting from war damage. Therefore, in this evaluation, the expenses for professional consultancy that should be factored into the reconstruction or maintenance of the damaged buildings are outlined as follows.

The professional consultancy costs that would be incurred for the supervision of damaged buildings are estimated based on the experience that consultancy expense represents 0.4% - 1.2% of the construction costs (Madushani et al, 2019).

In this assessment 1% of total construction cost is adopted. As a result, the professional consultancy costs will be:

Replacement construction cost multiplied by 1%;

$$US\$ 659,696.96 * 1\% = US\$ 6,596.97$$

Therefore, the total replacement cost for the damaged buildings reported so far has been summarized in Table 238 below, and the amount is estimated as US\$ 666,293.93.

Table 238. Total Replacement Cost for Damaged Bank Buildings (US\$ in Millions)

Items	Replacement Cost (US\$)
Damage on Buildings	0.66
Consultancy fee	0.01
Total	0.67

Damage to Cash and Inventory of Stock

Cash consists of cash on hand and near cash items while inventory of stock includes such items as office supplies, for instance stationery materials, minor office tools, and other consumable items looted while in store or in office. The amount of looted cash and inventory by zone is depicted in the following Table 239.

Table 239. Damage to Cash and Inventory of stock by Location (US\$ In millions)

Zone	Cash (US\$)	Inventory (US\$)
North Western	1.10	0.01
Central	6.42	0.04
Eastern	4.24	0.08
Mekelle	0.28	0.00
South Eastern	0.20	0.03
Southern	0.00	0.00
Total	12.24	0.16

Source: CITG Survey, 2022

All zones, with the exception of the Southern Zone, have reported their looted cash. The total amount of cash looted from banks reached US\$ 12,236,878.81. The Central Zone was the most impacted area regarding looted cash, representing 52.49% of the total amount looted, followed by the Eastern Zone, which accounts for 34.63% of the total looted cash. The least affected areas are Mekelle Zone and South Eastern Zone.

The economic repercussions of armed conflict extend far beyond the destruction of physical assets. The targeted looting of financial assets, particularly cash, represents a direct attack on the economic stability and livelihoods of the Tigray populations, undermining immediate relief efforts and hindering long-term recovery. The finding obviously establishes a substantial financial loss to the Tigray region, with a total of US\$ 12,236,878.81 in cash looted from banks. This figure represents a tangible depletion of liquid assets, impacting individuals, businesses, and potentially the functioning of financial institutions.

The total value of inventory that were burned, destroyed, or looted reached US\$ 161,133.94, with the Eastern Zone being the most affected. The Eastern Zone accounted for 50.55% of the total looted assets, while the Central Zone followed with 24.59% of the total destruction on inventory. The Southern Zone was the least impacted in terms of inventory, suffering only 0.25% of the losses. Banks operating within the Mekelle Zone experienced no damage or destruction to their inventories.

Overall, the amount of damage represents a significant financial loss to the affected banking institutions. The zonal disparities are crucial. They suggest that the war's economic impact was not uniform but rather concentrated in specific areas. This could be due to difference in intensity of fighting and the perpetrators may have specifically targeted the zones for their financial resources or to disrupt the financial system in that area.

Means of Damage

The perpetrators employed various methods during the wartime to carry out the destruction and theft of cash and inventory from the banks. To enable the looting, they bombarded certain office locations and set fires in other areas to eradicate the resources. Furthermore, they inflicted physical damage to support the looting efforts. The specifics are depicted in Table 240 below.

Table 240. Type of Damage Execution of Cash and inventory (US\$ in Millions)

Type of Damage Execution	Cash			Inventory		
	Damage (US\$)	Value	Share (%)	Damage (US\$)	Value	Share (%)
Looting	3,073,903.96		25.12	15710.55915		9.75
Theft	4,255,986.45		34.78	63792.92685		39.59
Destruction and Looting	294,908.78		2.41	9152.4		5.68
Fire and Theft	236,171.76		1.93	8443.4		5.24
Looting and Theft	2,010,519.19		16.43	30261.0		18.78
Destruction and Theft	294,908.78		2.41			
Destruction, Fire, Looting, and Theft	709,738.97		5.80	8685.1		5.39
Fire, Looting, and Theft	296,132.47		2.42			
Shelling (remote and deliberate), Destruction, Fire, Looting, Theft, and others	1,064,608.46		8.70			
Destruction				4463.4		2.77
Fire				11488.8		7.13
Shelling, Destruction, Fire, Looting, Theft, and others				9136.3		5.67
Total	12,236,878.81		100.00	161133.9		100

Source: CITG Survey ,2022

In reference to the data presented in Table 240, looting and theft constituted over 76.33%. Additionally, looting and theft that involved destruction made up 5.80%. A combination of

shelling, destruction, fire, looting, theft, and other activities represented 8.70%, while the remaining percentage is linked to a combination of destruction and looting (2.41%), destruction and theft (2.41%), igniting fires and theft (1.93%), and a mixture of fire, looting, and theft (2.42%).

In the same way the perpetrators utilized similar methods to execute the looting and destruction of inventory from the banks. As illustrated in Table 4-8 above, looting and theft accounted for 68.12%, while looting that was accompanied by igniting fires represented 5.24% and theft that involved physical destruction was 5.68%. The perpetrating parties set fires and depleted inventory at a rate of 7.13%, and their participation in physical destruction was noted as 2.77%. The remaining percentage, 11.06%, was attributed to physical destruction and various other methods collectively.

The amalgamation of these diverse tactics underscores a strategic objective to not only loot and obliterate resources but also to undermine the banking sector's operational capacity. The destruction is intended to ensure that the looted and destroyed assets remain irretrievable by legitimate authorities and to inflict enduring damage on the financial infrastructure within the Tigray region.

Damage Severity Level

The severity of the damage to cash and inventory is classified as complete destruction or looting. This level of impact indicates that the affected assets have either been entirely destroyed, rendering them unusable, or stolen in their entirety, resulting in a total loss. Such a situation can arise from catastrophic events like natural disasters, fires, or deliberate acts such as theft or vandalism, leading to significant financial and operational consequences for the affected entity. Immediate assessment and documentation of the losses are critical for insurance claims, recovery planning, and implementing measures to mitigate future risks.

Damage by Perpetrators

Referring to Table 241, it is clear that various armed forces participated in the Tigray war, leading to the looting and devastation of bank cash. The EDF was accountable for 19.81% of the looting and destruction of cash, whereas the ENDF was responsible for 4.83%. Furthermore, these two forces together looted and destroyed 29.95% of the cash. The data also suggests that the ENDF sometimes worked in conjunction with the EDF and at other times

with the Amhara forces to loot cash from the banks. The total joint looting and destruction by these three forces was determined to be 5.31%. Additionally, the combined looting and destruction executed by the ENDF, EDF, and Illegal armed group was noted as 17.39%, while the collaboration between the EDF and Illegal Armed group accounted for 4.83%. The remaining percentage is attributed to a mix of the ENDF, their allied forces, and even the Illegal Armed group.

Table 241. Perpetrators of Bank Cash and Inventory (US\$)

Perpetrator	Cash		Inventory	
	Damage Value (US\$)	Share(%)	Damage Value (US\$)	Share (%)
EDF	2,424,125.69	19.81	31662.81921	19.65
ENDF	591,041.25	4.83	4688.997654	2.91
EDF_ENDF	3,664,945.20	29.95	34708.25068	21.54
IRF	296,132.47	2.42		
ENDF_EDF_AMF	649,778.26	5.31	10554.27307	6.55
ENDF_EDF_IRF	2,127,993.23	17.39	61214.78381	37.99
ENDF_EDF_EFP_AMF	1,891,821.46	15.46	2819.84395	1.75
ENDF_EDF_EFP_AMF_AFF_IRF_O	-		10086.98464	6.26
thers				
EDF_IRF	591,041.25	4.83	2819.84395	1.75
ENDF_AMF			2578.14304	1.6
Total	12,236,878.81	100	161133.94	100

Source: CITG Survey, 2022

Concerning the individuals implicated in the destruction and looting of inventory stock, Table 241 reveals that the EDF's involvement was 19.65%, whereas the ENDF accounted for 2.91%. Together, these two entities were responsible for 21.54% of the stock. The combined looting and destruction executed by the ENDF, EDF, and Illegal Armed forces was determined at 37.99%, while that conducted by the ENDF, EDF, and Amhara forces was 6.55%. The remaining 11.36% is attributed to the actions of various forces, including illegal armed groups (robbers), whether individually or collectively.

The data clearly indicates the complex and dynamic nature of wartime alliances between the ENDF and the previously mentioned parties, especially in relation to the looting and destruction of cash and inventory of stock. It is important to underline the EDF's separate actions and their collaboration with the ENDF and Amhara forces in these perpetrating activities. The coordinated and widespread destruction and looting of cash and inventory from the banks signifies a deliberate act of economic warfare, aimed at destabilizing the region and depriving the civilian population of essential resources.

Damage to Furniture, Fixtures, and Equipment (FFE)

This section analyses the means of damage used against the Furniture, Fixtures, and Equipment (FFE) of the assessed banks, as detailed below tables. FFE includes essential non-electronic assets such as desks, chairs, security fixtures, and other operational equipment. The total documented damage value to these bank FFE items is US\$ 4.25 million. The findings reveal a combination of direct military action, deliberate destruction, and various forms of theft aimed at crippling the banks' operational capacity.

Means of Damage

Table 242.Type of Damage Execution to Bank FFE (%)

Means of damage	Damage Value (US\$ in Millions)	Share (%)
Shelling	0.12	2.73
Destruction	1.22	28.7
Fire	0.12	2.82
Looting	0.43	10.08
Theft	0.64	15.01
Shelling and Destruction	0.11	2.6
Destruction and Looting	0.22	5.19
Destruction and Theft	0.15	3.43
Fire and Looting	0.06	1.32
Looting and Theft	0.47	11.05
Destruction, Looting, and Theft	0.28	6.51
Shelling , Destruction, Looting, and Theft	0.09	2.07
Shelling (, Destruction, Fire, Looting, Theft, and others	0.36	8.49
Total	4.25	100

Source: CITG Survey ,2022

Referring to Table 242 above, the damage execution means for FFE was characterized by methods intended to render the physical premises unusable, alongside opportunistic theft of moveable assets. The single most common method was destruction of office premises, accounting for US\$ 1.22 million, or 28.70% of the total damage value. This high figure indicates a deliberate and systemic effort to physically obliterate the bank infrastructure. The three most commonly recorded methods involving the seizure or removal of assets included Theft (US\$ 0.64 million, 15.01%), Looting (US\$ 0.43 million, 10.08%), and a combination of Looting and Theft (US\$ 0.47 million, 11.05%). Collectively, these direct removal tactics account for over 36% of the damage. Furthermore, direct military action and complete obliteration were also significant: Deliberate Shelling caused damage valued at US\$ 0.12 million (2.73%), and entities also set Fire to assets, valued at US\$ 0.12 million (2.82%). Complex, combined tactics were also frequently employed: Destruction, Looting, and Theft combined caused damage of US\$ 0.28 million (6.51%), and the remaining percentage (10.56% or US\$ 0.45 million) accounts for highly destructive scenarios involving Shelling, Destruction,

Fire, Looting, Theft, and others. The diverse and frequently intersecting characteristics of these destructive actions illustrate a complicated interaction of military tactics, opportunistic offense, and intentional targeting of financial institutions. The results underscore the deep and intricate effects of the war on the banking industry, presenting considerable obstacles for rebuilding and the restoration of financial services essential for stability in the post-war period.

Damage Severity level

As it is indicated in Table 243 below, the total replacement cost of damaged and destroyed FFE was determined to be US\$ 4.249 million for the banks operating in Tigray. Of this overall effect, the total damaged part of the assets (Minor and Moderate Damage) was found to be US\$ 3.746 million (88.17%). Further classifying this damaged portion, US\$ 3.427 million (91.49% of the damaged amount) was categorized as Minor Damage (1-25% damage level), while the remaining US\$ 0.319 million (8.51%) consisted of assets with Moderate Damage (26-50% damaged). The total value of the destroyed furniture and equipment (Severely and Completely Damaged) has been reported as US\$ 0.503 million. Of this destroyed amount, US\$ 0.390 million (77.54% of the destruction) pertains to assets that sustained Severe Damage (51-75% destruction), while assets that were Completely Damaged (76-100% destruction) accounted for US\$ 0.113 million (22.46% of the destruction). The most significant damage and destruction is noted in banks situated in the Eastern Zone, which constitutes US\$ 1.780 million (41.89%) of the overall loss. This is followed by banks in the Central Zone (US\$ 1.334 million, 31.40%) and the North Western Zone (US\$ 0.830 million, 19.55%). The data indicates that nearly 93% of the total damage (US\$ 3.944 million) was recorded in banks situated within these three zones. Conversely, banks in the Southern Zone suffered the least severity, with merely US\$ 0.022 million (0.51%) of the total effect. This suggests that the conflict was heightened in these top three areas, and consequently, when developing compensation and recovery plans to mitigate the effects of the war on bank FFE, priority should be given to the Eastern Zone, followed by the Central and North Western zones.

Table 243. Damaged Bank FFE by Damage severity Level and Zone

Zone	Minor Damage	Moderate Damage	Severely Damage	Complete Damage	Total (Million (US\$))	Share (%)
North Western	0.718	0.050	0.037	0.026	0.830	19.55
Central	1.001	0.128	0.161	0.045	1.334	31.40
Eastern	1.448	0.123	0.182	0.026	1.780	41.89
Mekelle	0.051	0.002	0.001	0.000	0.054	1.27
South Eastern	0.199	0.010	0.004	0.015	0.229	5.38
Southern	0.011	0.005	0.005	0.001	0.022	0.51
Total	3.427	0.319	0.390	0.113	4.249	100

Source: CITG Survey, 2022

Damage Perpetrators

This section analyses the different military forces and armed groups identified as responsible for the damage and destruction of Furniture, Fixtures, and Equipment (FFE) belonging to the affected banks. The total damage value assessed is US\$ 4.25 million, which serves as the basis for the proportional shares of responsibility. The main forces involved include the Ethiopian National Defense Force (ENDF), Eritrean Defense Force (EDF), and Irregular Forces (IRF) and for further details, please refer to Table 244 below.

Table 244. Damage to FFE by Perpetrators (US\$ in Millions)

Perpetrator	Share (%)
ENDF	3.70
EDF	21.83
IRF	2.11
ENDF_EDF	36.35
ENDF_AMF	2.20
EDF_AMF	0.75
EDF_IRF	2.60
ENDF_EDF_AMF	5.15
ENDF_EDF_IRF	14.66
ENDF_EDF_AMF_IRF	1.41
ENDF_EDF_AMF_IRF	0.97
ENDF, EDF, AMF_IRF_AFF_Others	8.27
Total	100.00

Source: CITG Survey, 2022

As illustrated in Table 244 , the distribution of damage to Furniture, Fixtures, and Equipment (FFE) is highly complex, involving multiple actors in both singular and joint capacities. The most significant share of damage, 36.35%, is attributed to the combined actions of the Ethiopian National Defense Forces (ENDF) and the Eritrean Defense Forces (EDF) acting together. This suggests that over a third of the destruction to FFE occurred during joint or closely coordinated operations. Following this, the largest single-actor share is held by the EDF alone at 21.83%, indicating its prominent role in damaging FFE even without explicit coordination with the ENDF. Further emphasizing the dominance of the ENDF and EDF, their combined involvement with the IRF (unspecified International/Internal Regional Force) accounts for another 14.66% of the damage.

Collectively, the remaining shares of damage are distributed among a wide array of single- and multi-actor groups, none of which exceed a 10% individual share. The most expansive coalition listed, encompassing the ENDF, EDF, AMF, IRF, AFF, and other unspecified actors, still accounts for a substantial 8.27% of the total damage, underscoring the widespread nature of the conflict. The next largest coalition involves the ENDF, EDF, and the AMF (Amhara

Regional Forces), which together account for 5.15%. In contrast, the contributions from single actors other than the EDF are relatively minor: the ENDF alone accounts for only 3.70%, and the IRF accounts for just 2.11%. Overall, the data clearly indicates that the joint actions and individual operations of the ENDF and EDF are responsible for the vast majority of the FFE damage, with other forces playing considerably lesser, though still measurable, roles.

Damage to Generators and Vehicles

This section assesses the impact of the conflict on the banks' essential mobile and power-generating assets, specifically Vehicles and Generators. The analysis covers the means of damage execution, the severity of the damage, and the identities of the perpetrators. The total assessed damage value for this asset category is US\$ 3.10 million.

Means of Damage

The perpetrators utilized a variety of methods to disable and remove vehicles and generators, with a strong focus on seizure and appropriation rather than purely physical destruction (Table 245).

Table 245. Damage to Bank Vehicles and Generators by Means of damage(US\$ in Millions)

Means of damage	Damage Value(US\$ in Millions)	Share (%)
Shelling	0.14	4.55
Destruction	0.45	14.54
Looting	0.56	18.18
Theft	1.04	33.64
Looting and Theft	0.28	9.09
Destruction, Looting, and Theft	0.28	9.09
Shelling, Destruction, Looting, Theft, and others	0.34	10.91
Total	3.10	100.00

Source: CITG survey, 2022

As stated in Table 245, the techniques employed clearly preferred seizing the assets for operational use. Theft (US\$ 1.04 million, 33.64%) was the leading single method, followed by Looting (US\$ 0.56 million, 18.18%). When combined with Looting and Theft (US\$ 0.28 million, 9.09%), these acts of seizure account for nearly 61% of the techniques employed to inflict this damage. This suggests that the perpetrators favoured operating the vehicles and utilizing the generators rather than merely inflicting physical harm upon them. Meanwhile, direct destruction, including Destruction of premises (US\$ 0.45 million, 14.54%) and Shelling (US\$ 0.14 million, 4.55%), accounted for a smaller, though still significant, portion of the damage. Overall, the application of diverse methods for causing damage implies that the actions of the perpetrators were deliberate and strategic.

Damage Severity levels

This section presents the effect of the war on different assets, which include vehicles like automobiles, field cars, and motorcycles, as well as generators that produce electric power, in addition to other similar mechanical equipment. Table 246 illustrates the allocation of this category of assets across different zones along with the extent of damage recorded.

Table 246. Damage to Bank Vehicles and Generators by Damage Severity Level (US\$ in Millions)

Damage Severity Level	Damage value (US\$ in Millions)	Share(%)
Minor damage	0.5	17.33
Moderately Damaged	0.1	2.50
Severely damaged		0.00
Completely damaged	2.5	80.16
Total	3.1	100.00

Source: CITG Survey ,2022

As presented in Table 246 above, the amount of US\$ 2.5 million, which represents 80.16% of the total, consists of generators and vehicles that have been Completely Damaged (destroyed and/or looted, with damage exceeding 75% of their components). In contrast, only US\$ 0.6 million (19.84% of the total) was noted as damaged (Minor and Moderately Damaged). Specifically, Minor Damage accounts for US\$ 0.5 million (17.33%) and Moderately Damaged accounts for US\$ 0.1 million (2.50%). This stark contrast between the high value of Completely damaged assets and the low value of damaged assets underscores that the primary intent was asset removal or total obliteration.

Damage Perpetrators

The assessment team examined the identities of those responsible for causing damage and destruction to the vehicles and generators belonging to the affected banks. Figure 17 below shows the identified perpetrators.

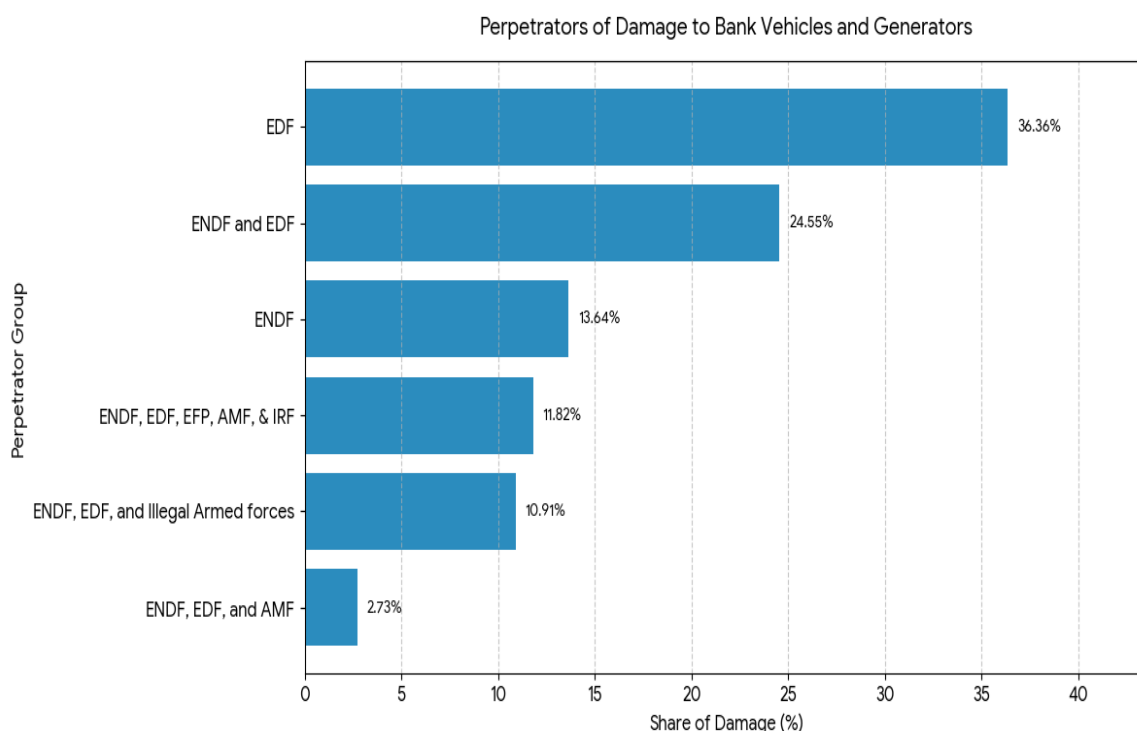


Figure 17: Perpetrators – Bank Vehicles and Generators

Source: CITG Survey, 2022

According to Figure 17 presented above, it is clear that the main perpetrators include EDF (36.36%), the joint forces of ENDF and EDF (24.55%), ENDF (13.64%), as well as the combined forces of ENDF, EDF, and illegal armed groups (10.91%). Additionally, the collaboration of ENDF, EDF, and Amhara forces in the damage was noted at 2.73%. The remaining percentage, which accounts for 11.82%, is attributed to the ENDF, Ethiopia Federal Police, EDF, and other military forces, including illegal armed groups.

The data strongly points towards the significant involvement of both Eritrean and Ethiopian federal forces in the destruction or disruption of the banking sector in Tigray Region. The highest single attributable percentage (36.36%) is assigned to the EDF. This suggests that the EDF was the most frequent single actor responsible for direct damage to bank vehicles and generators. This finding aligns with numerous reports from human rights organizations and international bodies detailing the significant involvement of Eritrean forces in the war in Tigray. The 13.64% attributed to the ENDF alone indicates their independent role in causing damage to financial institutions. While their direct attribution is lower than the EDF, their combined presence with the EDF and Amhara forces represents a significant portion of the identified perpetrators.

Damage to ICT Equipment and Infrastructure

The war in Tigray inflicted severe damage on the banks' essential ICT Equipment and Infrastructure, which includes computers, network devices, and related components. The total assessed damage value for this category is US\$ 2.52 million. This section analyzes the means used to inflict this damage, the resulting severity, and the identity of the perpetrators.

Means of damage

According to Table 247 The perpetrators utilized a variety of techniques to seize and damage ICT items, which are of significant interest due to their considerable value and advanced features. The main methods used to inflict damage on ICT resources were centered on seizure: Theft accounted for US\$ 0.68 million (27.16%); combined Looting and Theft for US\$ 0.35 million (13.87%); and looting alone for US\$ 0.29 million (11.55%). Consequently, looting, theft, and a blend of these activities have become increasingly prevalent among banks in the Tigray Region.

Table 247. Damage to Bank ICT Resources by Means of Damage (US\$ in Millions)

Means of damage	Damage value (US\$ in Millions)	Share (%)
Shelling	0.05	1.89
Destruction	0.40	15.76
Destruction and Looting	0.10	4.07
Destruction and Theft	0.11	4.28
Fire	0.09	3.48
Fire and Looting	0.03	1.09
Looting	0.29	11.55
Looting and Theft	0.35	13.87
Theft	0.68	27.16
Fire, Looting, and Theft	0.03	1.38
Shelling, Destruction, Looting, and Theft	0.09	3.49
Shelling, Destruction, Fire, Looting, Theft, and others	0.30	11.98
Total	2.52	100.00

Source: CITG Survey ,2022

Meanwhile, physical Destruction of premises was also a major method, accounting for US\$ 0.40 million (15.76%). Other methods of damage were recorded, such as: a combination of Destruction and Theft (US\$ 0.11 million, 4.28%); Destruction and Looting (US\$ 0.10 million, 4.07%); Fire (US\$ 0.09 million, 3.48%); and intentional Shelling (US\$ 0.05 million, 1.89%). Furthermore, a combination of Shelling, Destruction, Looting, and Theft was noted at a rate of 3.49% (US\$ 0.09 million), while the combination of fire, looting, and theft accounted for 1.38% (US\$ 0.03 million). The remaining percentage, which is 11.98% (US\$ 0.30 million), represents the use of various other methods, including shelling, destruction, fire, and theft.

Damage Severity Level

The total worth of ICT items that were either damaged or destroyed has been assessed at US\$ 2.52 million. This damage is primarily segmented into two categories. First, the Damaged (Minor and Moderate) portion constitutes nearly 92% of the total, amounting to US\$ 2.316 million, corresponding to assets with damage up to 50% of their components. Within this repairable category, Minor Damage (up to 25% damage) accounts for the vast majority, at US\$ 2.194 million (87.1% of the total loss), while Moderate Damage (26-50% damage) accounts for US\$ 0.12 million (4.8%). Second, the Destroyed (Severe and Complete) portion represents the balance, amounting to US\$ 0.204 million (about 8%), pertaining to assets rendered unusable beyond 50% of their value. This non-recoverable destruction is composed of Completely Damaged assets (beyond 75% damage), valued at US\$ 0.148 million (5.9% of the total loss), and Severely Damaged assets (51-75% damage), valued at US\$ 0.056 million (2.2% of the total loss). Crucially, while the large majority of the financial damage value falls under the Minor category, the total destroyed amount of US\$ 0.204 million represents a complete loss, with nearly 73% of this destruction attributed to assets that were destroyed beyond 75% of their value (Table 248).

Table 248. Damage to Bank ICT Resources by Damage Severity Level (US\$ in Millions)

Damage severity Level	Damage Value (US\$)	Share(%)
Minor damage	2.194	87.1
Moderate damage	0.12	4.8
Severely Damaged	0.056	2.2
Completely Damaged	0.148	5.9
Total (Million US\$)	2.518	100.0

Source: CITG ,2022

Damage by Perpetrators

As indicated in Table 249, the damage to the ICT equipment and infrastructure of the banks was overwhelmingly caused by the combined and individual actions of the Ethiopian National Defense Forces (ENDF) and the Eritrean Defense Forces (EDF). The most significant single contributor to the damage was the joint action of the ENDF and EDF together, accounting for a massive 33.99% of the total damage. This substantial percentage emphasizes the high degree of operational synergy, or joint action, between these two forces in targeting banking ICT assets. The second most prominent cause was the EDF operating alone, which was responsible for a significant 24.91% of the damage. When combined, these two categories alone account for over half (nearly 59%) of the total destruction.

The remaining damage is distributed across various coalitions. The ENDF's collaboration with the EDF and unspecified illegal armed forces caused a substantial 15.32% of the damage. Other joint efforts include the EDF alongside Irregular Armed Forces (IRF), which accounted for 3.27%. The ENDF operating independently caused a minor 2.69% of the damage, while the partnership between the EDF and Amhara forces (AMF) was the least recorded, responsible for only 0.87%. In summary, the data clearly suggests that the EDF played a crucial and pervasive role in the perpetrating activities, both independently and in various collaborations, highlighting the interconnected and intentional actions of these forces in the war's operations.

Table 249. Damage to Bank ICT Resources by Perpetrators (US\$ in Millions)

Perpetrators	Share (%)
ENDF	2.69
ENDF_EDF	33.99
ENDF_AMF	2.25
EDF	24.91
EDF_AMF	0.87
EDF_IRF	3.27
IRF	2.18
ENDF_EDF_AMF	4.43
ENDF_EDF_IRF	15.32
END_EDF_EFP_AMF	1.53
ENDF_EDF_AMF_IRF	1.52
ENDF_EDF_EFP_AFF_IRF_Others	7.04
Total	100.00

Source: CITG Survey ,2022

The data presented in the Table 249 above suggests that the EDF played a crucial role in the perpetrating activities. They participated in these actions both individually and in collaboration with the ENDF, Amhara forces, and other groups. The significant percentage associated with the combined forces of the ENDF and EDF, as well as the ENDF and others, emphasizes the extent of operational synergy or joint action among Ethiopian, Eritrean, and Amhara forces. This indicates that, in numerous cases, the damage inflicted was not solely the result of one entity's actions but rather a product of their collective presence and efforts. This highlights the interconnectedness and intentional actions of these forces within the operations of the war in Tigray Region.

Damage to MFI Assets

The previous part shows the effect of the war on all 18 banks operating within the Tigray Region. Nevertheless, the war in Tigray, which lasted for two years from November 2020 to November 2022, has also impacted the Microfinance subsector in the region, which primarily consists of two major institutions: Dedebit Credit and Savings Institution S/C (DECSI) and

Adeday Microfinance Institution S/C (AMFI). This section of the assessment report provides a comprehensive analysis of the war's effect on microfinance institutions.

Damage to Buildings

The war perpetrated severe damage on the infrastructure of Microfinance Institutions (MFIs): of the 40 buildings owned by MFIs, 34 were assessed, and 29 of those sustained attacks of various degrees. Six buildings in Western Tigray could not be investigated due to security restrictions. The financial impact of this structural damage is substantial; based on the replacement cost prevalent in early 2022, the estimated total damage for the 29 affected buildings is US\$ 1.66 million. Additionally, damage to nine separate guard houses added US\$0.01 million to the infrastructure loss, highlighting the severe financial consequences of the war on the institutions' physical assets.

Table 250. Damage to Building and Building parts of MFI by Value (US\$ in Millions)

Zone	Damage to the main Buildings (in US\$ In millions)	Damage on Guard Inspection Houses (in US\$ In millions)	Total costs (in US\$ in Millions)	Share (%)
North Western	0.52	0.0005	0.52	31.08%
Central	0.38	0.0060	0.39	23.20%
Eastern	0.52	0.0017	0.52	31.23%
Mekelle	0.01	0.00	0.01	0.69%
South Eastern	0.07	0.00	0.07	4.48%
Southern	0.16	0.0004	0.16	9.32%
Total	1.66	0.0087	1.67	100.00%

Source: CITG Survey, 2022

Table 250 reveals that the total estimated replacement cost for structural damage to Microfinance Institution (MFI) buildings across Tigray is approximately US\$1.67 million, based on 2022 market value. This destruction is devastatingly concentrated in the main MFI buildings (US\$1.66 million), with damage to guard houses being financially negligible. Geographically, the impact is highly uneven, with the Eastern Zone (31.23%) and the North Western Zone (31.08%) suffering the highest shares of destruction, followed by the Central Zone (23.20%). Collectively, these three zones account for over 85% of the assessed damage, while the Mekelle and South Eastern zones experienced minimal structural loss, indicating a targeted and geographically specific pattern of destruction to MFI physical infrastructure.

This analysis underscores the necessity for zone-specific response strategies, taking into account the differing levels of damage, to ensure equitable recovery of the buildings. Furthermore, comprehending the extent of damages could assist in obtaining funding and resources for rehabilitation efforts in the most impacted zones. Overall, the findings underscore

the severe consequences of the Tigray war on the infrastructure of MFIs and emphasize the critical importance of targeted recovery strategies to meet the diverse needs of various zones.

Means of damage

The perpetrators employed numerous methods to carry out the destruction of the buildings belonging to MFIs. In nearly every building, the damages were intentional. In the buildings located at Adidaero, Hageresalam, Edagaarbi, Adet, Wukromaray, and Fatsi, intentional burning occurred. In other cases, shooting at glazing structures from close range and breaking doors and windows for the purpose of looting was prevalent. Notably, the building in Abiadi was subjected to artillery shelling despite the absence of active warfare in the vicinity. Overall, looting is documented as the primary cause of damage in MFI buildings, accounting for 62.96% of the total. The details are illustrated in Figure 18.

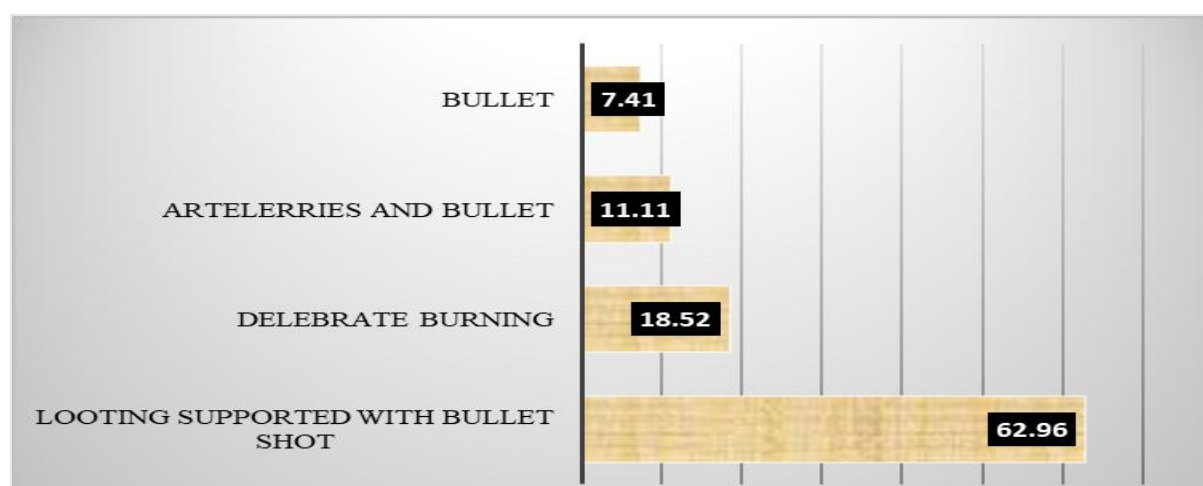


Figure 18: Means of Damage execution Building of MFI (%)
Source: CITG Survey, 2022

The finding strongly suggests that the destruction of Microfinance Institution (MFI) buildings was not collateral but a deliberate and systematic action by the perpetrators. The assertion that damages were intentional across nearly all affected buildings highlights a calculated strategy to cause maximum harm to company infrastructure and resources. This targeted approach aimed to severely undermine the operational capacity of the MFIs, with the likely strategic objective of disrupting the crucial social services and community support functions provided by these organizations. In summary, the prevalence of intentional damage, combined with evidence of looting and violence, reveals the underlying motivation to cause systemic disruption, underscoring the depth of the crisis facing Tigray's MFIs and emphasizing the urgent need for intervention to restore essential financial and community services.

Damage Severity Level

Table 251. Damage to Building and Building parts of MFI by Damage severity Level (US\$ in Millions)

Damage Severity Level	Damage Value (US\$ in Millions)	Share (%)
Severe Damage	0.63	37.94
Moderate Damage	0.52	31.03
Minor Damage	0.52	31.03
Total	1.67	100.00

Source: CITG Survey, 2022

Table 251 reveals that Microfinance Institution (MFI) buildings across Tigray suffered a total structural loss of US\$ 1.67 million, a destruction level that is nearly equally distributed across three severity categories, which is crucial for determining the recovery strategy. The most critical category, Severe Damage, accounts for US\$ 0.63 million, representing the largest single share at 37.94% of the total assessed damage. This means that over a third of the affected buildings require major reconstruction and high-cost resources due to the critical nature of the damage. However, the remaining destruction is less severe, with Moderate Damage costing US\$ 0.52 million (31.03%) and Minor Damage also costing US\$ 0.52 million (31.03%). Collectively, the structures that sustained only Moderate or Minor Damage total US\$ 1.04 million (over 62% of the damage value). This distribution allows for a two-tiered resource allocation strategy: prioritizing critical funding for the severely damaged structures while executing rapid, cost-effective rehabilitation on the less impacted buildings to quickly restore essential MFI functions.

Damage by Perpetrators

With regard to Table 252 presented above, conclusively indicate that the destruction of MFI buildings was primarily a result of actions by the Eritrean Defense Forces (EDF), the Ethiopian National Defense Forces (ENDF), and various Amhara forces (including Special Force, 'Fano', and Militia). The EDF is identified as the primary contributor to the destruction, responsible for 39.59% of the damage share, which raises significant concerns regarding their focused military strategy. The ENDF follows closely, accounting for 35.72% of the damage, while Amhara forces are responsible for 21.24%. Crucially, the remaining 3.45% of damage resulted from coordinated operations between the ENDF and Amhara forces, demonstrating a level of joint responsibility and strategic cooperation in causing harm to these public financial institutions.

Table 252. Damage to MFI Buildings by Share (US\$ in Millions)

Perpetrator	Damage Value (US\$ in millions)	Share (%)
EDF	0.66	39.59
ENDF	0.60	35.72
AMF	0.35	21.24
ENDF_AMF	0.06	3.45
Total	1.67	100.00

Source: CITG and Market data, 2022

Construction Consultancy Cost

The international valuation standards state that the costs related to acquiring professional consultancy services for the reconstruction of damaged buildings are included in the overall damage cost. Hence, the market price that prevailed during January to February 2022 for professional consultancy services applicable to all buildings, excluding those situated in Western Tigray, was gathered from three consultancy firms, and the average value is utilized to assess the damage amount. The projected cost for the consultancy service is presented in Table 253.

Table 253. Professional consultancy cost for MFI Buildings (US\$ in millions)

Items for Consultancy Work	Average Expected Amount (US\$)
Professional payment	0.04
Per diem	0.03
Overhead costs	0.00
Transportation cost	0.00
Sub-total	0.08
VAT (15%)	0.01
Grand total	0.09

Source: CITG and Market data, 2022

Table 253 details the estimated financial outlay required for the professional consultancy work necessary for the MFI building recovery, totalling US\$0.09 million. The majority of this expense is dedicated to professional payments (US\$0.04 million) and per diem costs (US\$0.03 million), collectively accounting for approximately 78% of the sub-total. Crucially, costs associated with overhead and transportation were recorded as negligible. After factoring in a 15% VAT, the final estimated cost for engaging consultants to oversee the repair and reconstruction of MFI buildings stands at US\$0.09 million.

Table 254. Summary of replacement cost for damaged MFI Buildings and Guard Houses (US\$ in millions)

Items	Replacement Cost (US\$ in Million)
Damage to Buildings	1.66
Damage to Guard Inspection Houses	0.01
Consultancy fee	0.09
Total	1.76

Source: CITG and Market data, 2022

Table 254 summarizes the total calculated replacement cost for the physical rehabilitation of MFI infrastructure, reaching a grand total of US\$1.76 million. The overwhelming majority of this expense is attributed to the direct cost of damage to the main MFI Buildings (US\$1.66 million), which accounts for approximately 94% of the total. Damage to Guard Inspection Houses is financially minor at US\$0.01 million. The final total of US\$1.76 million integrates the direct structural replacement costs with the necessary Consultancy Fee (US\$0.09 million), representing the comprehensive financial requirement for the physical restoration and management of the MFI properties.

Looting of Cash and Inventory of Stock

Table 255 indicates that Microfinance Institutions (MFIs) suffered a combined total loss of US\$2.008 million due to the widespread looting of cash and inventory across the assessed zones. The overwhelming majority of this financial loss is attributed to the theft of liquid assets, with looted cash totaling US\$1.537 million (approximately 76.5% of the combined physical asset loss), while looted inventory accounts for the remaining US\$0.471 million. This significant imbalance demonstrates that cash was the primary, high-value target during the looting incidents, underscoring the severe and immediate depletion of the institutions' operating capital.

Table 255. Looted MFI Cash and Inventory categorized by Zone (US\$ in millions)

Zone	Looted Cash and Inventory (Million US\$ in Millions)			
	Cash	Share (%)	Inventory	Share (%)
Western	0.575	37.42	0.200	42.46
North Western	0.167	10.88	0.060	12.74
Central	0.214	13.95	0.092	19.53
Eastern	0.389	25.3	0.041	8.7
Mekelle	0.136	8.85	0.057	12.1
Southern	0.055	3.55	0.015	3.19
South Eastern	0.001	0.05	0.006	1.28
Total	1.537	100	0.471	100

Source: CITG Survey ,2022

The financial damage was highly concentrated geographically, with the Western Zone suffering the most significant impact by far, accounting for the largest share of both looted cash (US\$0.575 million, or 37.42%) and inventory (US\$0.200 million, or 42.46%). Substantial losses were also recorded in the Eastern Zone (US\$0.389 million in cash) and the Central Zone (US\$0.214 million in cash and US\$0.092 million in inventory). Conversely, the Southern and South Eastern zones experienced only minor financial losses from looting. This uneven

distribution highlights a distinct, geographically specific pattern of asset stripping concentrated in key administrative zones outside of the urban center of Mekelle.

Means of Damage Type

The act of looting has been documented as the main method through which the perpetrators caused harm to the cash and inventory of the MFIs. This technique emphasizes the immediate acquisition of tangible assets, reflecting a considerable level of opportunism and unrestricted physical access to cash and inventory. It suggests a methodical campaign of resource extraction, probably requiring substantial logistical effort to transport the looted and stolen items. This shows the operational conditions encountered by the institutions during the Tigray war, uncovering a strategy utilized by the perpetrators that is primarily cantered on asset depletion and disruption of organizational functions.

Level of Damage

As previously mentioned, the MFIs suffered losses to their cash and inventory. These assets were mainly looted by the perpetrators, indicating a level of damage ranging from 76% to 100%.

Identity of Perpetrators

Table 256. Damage to Cash and inventory by Perpetrators (US\$ in millions)

Perpetrators	Cash _Inventory (US\$ in Millions)	Share(%)
ENDF	0.28	14.02
EDF	0.70	35.10
AMF	0.84	41.63
EDF_ENDF_AMF_IRF	0.13	6.34
ENDF_AMF	0.01	0.37
ENDF_EDF	0.05	2.54
Total	2.01	100.00

Source: CITG Survey ,2022

The total loss of Microfinance Institution (MFI) cash and inventory, valued at approximately US\$2.01 million, is overwhelmingly attributed to a concentrated set of actors, primarily the Amhara Forces (AMF) and the Eritrean Defense Forces (EDF). The Amhara Forces are identified as the single largest contributor to this asset stripping, responsible for US\$0.84 million, accounting for 41.63% of the total looted value. The Eritrean Defense Forces follow closely behind, contributing US\$0.70 million, or 35.10% of the loss. Crucially, the combined actions of the AMF and EDF drove over 76% of the asset losses, establishing a clear pattern of

systematic and high-volume theft aimed at immediately depleting the MFI's liquid capital and inventory.

The Ethiopian National Defense Forces (ENDF) also played a significant role, independently accounting for US\$0.28 million (14.02%) of the looted assets. Furthermore, the data confirms that joint operations between the various forces, including the ENDF, EDF, AMF, and others, were responsible for a combined loss of US\$0.19 million (9.25%). This financial evidence from the attribution table confirms that the depletion of MFI liquid assets was the result of a multifaceted and collaborative strategy among the coalition forces, with the primary objective being the strategic stripping of immediately accessible financial resources from the region's microfinance system.

Damage on Furniture, Fixtures, and Equipment (FFE)

Furniture, fixtures, and office equipment represent another class of assets belonging to the MFIs, which have sustained damage as a result of the war in Tigray. These office assets include safe boxes, chairs, tables, shelves, cupboards, and calculators, among others found in different branch offices.



Sample of a damaged cash safe box along with a table at DECSI

Based on current replacement costs, the FFE that were either damaged or looted hold a value of US\$ 1,583,444.06. The damage to FFE for DECSI totals US\$ 1,535,565.99, which constitutes 97% of the overall damage. This damage was not categorized by zone, as the company keeps the FFE records at the head office level, with the exception of the Western Zone, which is managed by the Humera Branch. For additional details, please see Table 4-21 below.

Table 257. Current Replacement Cost of Damage FFE_ DECSI & AMFI (US\$ in Millions)

Zone	DECSI Damage Value (US\$ in Millions)	AMFI Damage Value (US\$ in Millions)
All Zones Except Humera Branch	1.16	0.0479
Humera Branch (Western Zone)	0.38	
Total	1.54	

Source: CITG Survey ,2022

Table 257 indicates a substantial and concentrated financial loss related to the destruction of Furniture, Fixtures, and Equipment (FFE) across the Microfinance Institutions (MFIs). The total current replacement cost for damaged FFE is US\$1.5879 million. The overwhelming majority of this damage, over 96%, is attributed to the Dede-bit Credit and Savings Institution (DECSI), which incurred a loss of US\$1.54 million. In contrast, the Adeday Microfinance Institution (AMFI) suffered a comparatively minor loss of US\$0.0479 million. A significant component of the total DECSI damage is localized in the Humera Branch (Western Zone), which alone accounts for US\$0.38 million in lost operational assets. This high replacement cost underscores the severe destruction of basic office materials, computers, and internal fixtures, representing a major financial impediment to the MFIs' ability to quickly restore lending and administrative operations.

Damage of damaged Sales Counter, Cashier's Box, and Curtains

As indicated in Table 258 below, the total replacement costs for these damaged and/or looted assets amount to US\$ 0.61 million, of which the Western Zone represents 58.46%. The assessment of the replacement cost for these assets was carried out independently, as it necessitated specific engineering estimates.

Table 258. Replacement cost of damaged Sales Counter, Cashier's Box, and Curtains

Asset Type	Estimated Replacement cost (US\$)			Share (%)
	All Except Humera branch offices	Humera branch offices	Total (US\$ in Millions)	
Sales (office) Counter	0.07	0.17	0.25	40.52
Cashier's Box	0.06	0.11	0.18	29.20
Curtain	0.12	0.07	0.18	30.28
Total	0.25	0.35	0.61	100.00

Source: CITG Survey ,2022

The total estimated replacement cost for the damaged Sales Counter, Cashier's Box, and Curtains across all surveyed branch offices is \$0.61 million. A significant portion of this damage, totaling \$0.35 million, is attributed to the Humera branch offices, making their replacement cost notably higher than the \$0.25 million reported for all other branches combined. The Sales Counter represents the single most expensive replacement item overall at

\$0.25 million, with the Humera branch bearing the majority of that cost (US\$0.17 million). The Cashier's Box and Curtains both have similar overall costs, around \$0.18 million each. While the Cashier's Box replacement cost is higher in Humera (US\$0.11 million), the replacement cost for Curtains is actually higher in the branches "All Except Humera" (US\$ 0.12 million). Overall, the data clearly indicates that the Humera branch offices sustained the most substantial financial damage to this specific group of assets.



Sample of a damaged sales counter and cashier's box at DECSI

Means of Damage Execution

The perpetrators mainly employed looting and physical destruction as methods to inflict damage on equipment and furniture of MFI offices. Furthermore, remote shelling was noted in some areas, targeting MFI offices specifically situated in the towns of Yechila, Abi-Adi, and Adi-daero.

The substantial proportion of damage attributed to looting highlights a widespread, systematic, and ground-level effort to deprive the MFIs of their material resources. This suggests that the perpetrators likely had significant physical presence or control over the areas where MFI assets were located, enabling widespread and direct confiscation of resources.

In contrast, the smaller yet significant proportion of damage resulting from long-range artillery fire reflects a more targeted strategy. By focusing on administrative facilities in specific towns like Yechila, Abi-Adi, and Adi-daero, the perpetrators likely aimed not only to inflict physical destruction but also to undermine the MFIs' operational capacity, disrupting their command and control rather than direct asset acquisition.

Level of Damage

The damage assessment team gathered information regarding the extent of damage sustained by each affected asset located in the visited offices of the MFIs. Consequently, the extent of damage sustained by the various office furniture, fixtures, and equipment is estimated to be complete damage as the majority of these items were either looted or suffered significant destruction at the hands of the perpetrators. The results suggest that the MFI assets were targeted during the wartime, as they either faced total destruction or were seized by the perpetrators.

Perpetrators

The total damage value of \$0.61 million to the MFI's FFE is overwhelmingly attributed to the ENDF (Ethiopian National Defense Force), either acting alone or in collaboration with other forces.

Table 259. Damage of FFE by perpetrators (US\$ in Millions)

Perpetrators	Damage Value (US\$ in Millions)	Share (%)
ENDF	0.39	63.89
EDF	0.10	16.74
AMF	0.08	13.69
ENDF_EDF_AMF_IRF	0.03	4.17
ENDF_AMF	0.00	0.22
ENDF_EDF	0.01	1.29
Total	0.61	100.00

Source: CITG, 2022

The Table 259 stated that the ENDF as the primary source of the destruction, responsible for inflicting \$0.39 million in damage, which constitutes the majority share at 63.89%. Following the ENDF, the EDF (Eritrean Defense Force) and the AMF (Amhara Militia/Forces) were the next largest individual contributors, with damages of \$0.10 million (16.74%) and \$0.08 million (13.69%), respectively.

The remaining damage value is distributed among coordinated attacks: the combined action of four or more groups (ENDF, EDF, AMF, and IRF) caused \$0.03 million (4.17%) in damage, and other collaborative efforts (like ENDF/EDF and ENDF/AMF) accounted for the small remainder of 1.51% (US\$ 0.01 million). The interpretation strongly suggests that the destruction was intentional, aimed at undermining MFI operations and the local community, with the ENDF bearing the primary responsibility for both direct involvement and cooperation with other forces in targeting civilian economic resources.

Damage to Generators and Vehicles

The war in Tigray has caused considerable damage to the generators and vehicles owned by the MFIs operating in the region. The details of the damage are outlined as follows.

Replacement Cost of Damaged Generators and Vehicles

Table 260. Current replacement cost of damaged MFI Vehicles and Generators (US\$ in Millions)

Asset Type	Replacement cost in US\$	Share (%)
Motorcycles	0.18	9.75
Cars	1.56	84.52
Generators	0.11	5.73
Total	1.85	100.00

Source: CITG Survey ,2022

Table 260 details the estimated current replacement cost for generators and vehicles belonging to Microfinance Institutions (MFIs) that were damaged or looted. The total estimated replacement cost for these assets is \$1.85 million, which corresponds precisely to the specific figure of \$1,849,856.91 mentioned in the accompanying text. This total cost is broken down into three asset categories: Motorcycles, Cars, and Generators. Table 260 also indicates that Cars account for the overwhelming majority of the estimated replacement costs:

- ✓ **Cars** are responsible for \$1.56 million of the total cost, representing 84.52% of the replacement value for these assets. This high value suggests that either a large number of cars were damaged, or the vehicles themselves were of high value, or both.
- ✓ **Motorcycles** account for the second-largest portion, with a replacement cost of \$0.18 million, making up 9.75% of the total.
- ✓ **Generators** have the lowest impact on the total replacement cost, estimated at \$0.11 million, which is only 5.73% of the total.

In summary, the financial impact of the damage and looting on the MFIs' transport and power assets is predominantly concentrated in the Car category, which far outweighs the combined replacement costs of the Motorcycles and Generators. The total estimated replacement cost of \$1.85 million for these specific assets was determined using current pricing data from local suppliers and company websites.

Means of Damage

Within this category of assets, looting has been documented as the predominant method of causing damage. The perpetrators opted to operate the vehicles and utilize the generators they

had looted from the different offices, while also destroying few remaining items that they did not take with them.

Level of Damage

The items categorized here have primarily been looted by the perpetrators and/or completely destroyed, indicating a destruction level ranging from 76% to 100%.

Identity of Perpetrators

Table 261. Summary of perpetrators: MFI Generators and Vehicles

Perpetrator	Damage value (US\$ in Millions)	Share (%)
Ethiopian National Defense Forces	1.20	65.00
Eritrean Defense Forces	0.31	17.00
Amhara forces	0.26	14.00
Others (Joint forces/Irregular armed forces)	0.07	4.00
Total	1.85	100.00

Source: CITG Survey ,2022

The Table 261 clearly identifies the **Ethiopian National Defense Forces (ENDF)** as the party responsible for the largest share of the damage to these specific high-value assets.

The financial damage to the Microfinance Institutions' (MFI) vehicles and generators, which totals \$1.85 million, is predominantly attributable to the Ethiopian National Defense Forces (ENDF). The ENDF inflicted an estimated \$1.20 million in damage, accounting for the vast majority at 65.00% of the total loss. The Eritrean Defense Forces (EDF) were the next largest contributors, causing \$0.31 million in losses, representing 17.00 % of the total. Following them, the Amhara Forces were responsible for \$0.26 million in damage, constituting 14.00% of the total replacement cost. The remaining damage, a minor portion totaling \$0.07 million (or 4.00%), is attributed to various "Others" categorized as joint or irregular armed forces.

In summary, the ENDF is overwhelmingly responsible for nearly two-thirds of the \$1.85 million replacement cost for the damaged MFI vehicles and generators, with the EDF and Amhara forces contributing the majority of the remaining losses. This pattern mirrors previous findings regarding the overall destruction of MFI assets, establishing the ENDF as the primary driver of financial damage.

Damage to ICT Equipment and Infrastructure

Another category of assets owned by the MFIs that experienced damage, destruction, and looting due to the war in Tigray was ICT equipment and infrastructure. The assets classified

within this group comprise equipment such as desktop computers, printers, scanners, laptop computers, photocopy machines, fax machines, UPS units, other related office machines, in addition to network devices and infrastructure, including routers, switches, modems, network toolkits, and network cables. This section details the effects of the war on these assets.

Table 262. Estimated replacement cost for the overall ICT Items - MFI (US\$ in Millions)

Asset Category	Estimated Replacement cost: ICT Assets of DECSI (US\$)			AMFI (US\$)	Total Replacement value	
	All Except Humera branch	Humera branch	Total value (US\$ in Millions)	In All branches	US\$ in Million	Share (%)
Computer and Related Office Machines	1.54	0.33	1.87	-	3.74	1.87
Network Devices	0.56	0.19	0.75	-	1.51	0.75
Network Infrastructure	0.03	0.03	0.06	-	0.12	0.06
IT: Other Assets	0.02	0.00	0.03	-	0.05	0.03
Other Additional/Overhead Cost considerations	0.08	0.03	0.10	-	0.20	0.10
Total	2.23	0.58	2.81	0.08	5.70	2.89

Source: CITG Survey ,2022

As indicated in Table 262 The estimated total replacement cost for the damaged Information and Communications Technology (ICT) items belonging to Microfinance Institutions (MFIs) is substantial, totaling \$5.70 million. This total cost is divided between the assets of two different institutions: DECSI and AMFI, with a combined replacement value of \$2.81 million for DECSI and AMFI's ICT assets across their branches, and an additional \$2.89 million listed in the final column that appears to represent a broader total or a calculation based on doubling the DECSI and AMFI totals, leading to the overall \$5.70 million. Within the DECSI assets, the majority of the damage (\$2.23 million) occurred in the "All Except Humera" branches, compared to \$0.58 million at the Humera branch.

The Computer and Related Office Machines category represents the largest single financial loss, with a total estimated replacement cost of \$3.74 million. This is followed by Network Devices at \$1.51 million. The combined replacement cost of these two core categories accounts for over 92% of the total ICT damages. The Network Infrastructure, IT: Other Assets, and Other Additional/Overhead Costs account for the smaller remainder of the total damages. Notably, the DECSI branches "All Except Humera" sustained the highest replacement cost in

every single asset category compared to the Humera branch, totaling \$2.23 million against Humera's \$0.58 million for DECSI's portion of the damages.

Type of Damage

The ICT equipment and infrastructure were significantly affected by the war, drawing the attention of the perpetrators due to their high value and newness; consequently, looting was considerable. For microfinance institutions ICT assets house the operational database, client records, transaction histories, and accounting software. The successful looting of these assets results in several strategic losses, such as the loss of institutional memory and data integrity and disruption of communication and coordination.

The extent of damage linked to looting underscores the primary objective of the perpetrators to deprive the MFIs of their ICT resources. Similar to the points made in relation to damage execution methods applied for office assets, this suggests that the perpetrators probably maintained a physical presence or control over the locations where the institutions' assets were situated, facilitating extensive and direct appropriation of these resources.

Level of Damage

The level of damage incurred by the specified ICT assets is assessed as completely damaged, given that most of these assets were either looted or experienced considerable destruction inflicted by the perpetrators

Damage by Perpetrators

Regarding the identities of the perpetrators, as illustrated in the bar chart below, the EDF caused substantial damage to the MFIs by primarily looting 35.12% of their ICT assets, followed by ENDF and Amhara forces, which accounted for 24.22% and 22.37%, respectively. The rest of the damage on ICT items was caused by the various forces jointly, and also involving irregular armed forces.

Table 263. Damage to ICT infrastructure for MFI by Perpetrators (US\$ in Millions)

Perpetrators	Damage Value (US\$ in Millions)	Share (%)
EDF	2.00	35.12
ENDF	1.38	24.22
AMF	1.28	22.37
ENDF_AMF	0.01	0.22
ENDF_EDF	0.08	1.32
ENDF_EDF_AMF_IRF	0.95	16.75
Total	5.70	100.00

As depicted in Table 263 the total replacement cost for damage inflicted upon the Microfinance Institutions' (MFI) Information and Communication Technology (ICT) infrastructure is estimated at US\$5.70 million. The destruction is overwhelmingly attributed to the Eritrean Defense Forces (EDF), the Ethiopian National Defense Forces (ENDF), and the Amhara Forces (AMF), which collectively account for over 81% of the total monetary damage. The EDF is identified as the single largest contributor, responsible for US\$2.00 million (35.12%) of the damage. The ENDF follows closely with US\$1.38 million (24.22%), and the AMF is responsible for US\$1.28 million (22.37%). Crucially, a highly significant portion of the damage, valued at US\$0.95 million (16.75%), resulted from coordinated attacks involving the ENDF, EDF, AMF, and the IRF. This joint operation damage highlights a clear strategic alignment among the military entities in targeting and dismantling the critical digital backbone of the MFI sector. The high total cost underscores the severity of the calculated effort to paralyze the institutions' capacity for communication, data management, and digital operation.

Loss by category

The war imposed a devastating total financial loss of over \$611.07 million on the financial sector, with Banks bearing the majority of this burden and Microfinance Institutions (MFIs) sustaining a smaller, yet substantial, loss. Banks incurred a total loss of \$488.39 million, with their losses heavily concentrated in Additional Costs (US\$ 300.85 million or 61.60%) of their total), followed by Lost Profit (US\$173.32 million). Conversely, while MFIs were the focus of the preceding tables detailing direct asset damage (totaling US\$ 5.35 million in direct replacement costs), they incurred a total loss of \$122.68 million, a figure that is dominated by Lost Profit (US\$76.78 million, or 62.59% of their total), followed by Additional Costs (US\$39.74 million).

Table 264. Loss value of Financial Institution (US\$ in millions)

Categories	Banks Loss		MIF Loss		Total Loss	
	Loss Value (US\$ in Millions)	Share (%)	Loss Value (US\$ in Millions)	Share (%)	Loss Value (US\$ in millions)	Share (%)
Lost Profit	173.32	35.49	76.78	62.59	250.1	40.93
Additional Costs	300.85	61.60	39.74	32.39	340.59	55.74
Expected Credit Loss	14.22	2.91	6.16	5.02	20.38	3.34
Total Losses	488.39	100.00	122.68	100.00	611.07	100.00

Source: CITG 2022

Thus, the Banks' losses were primarily driven by non-asset-related expenses, whereas the MFIs were hit hardest by lost revenue potential. This implies a direct and severe impact on their core

mission of serving vulnerable populations, as the breakdown in lending undermines community finance and is compounded by the \$5.35 million in direct asset replacement costs they must finance, leading to reduced outreach and potential long-term financial exclusion. Collectively, these losses translate into a crisis of access to capital and financial services, with the immense loss of capital and operational capacity impeding economic recovery by halting the crucial engine of credit, creating inflationary pressure as overhead costs are passed to clients, and damaging investor confidence, which is essential for attracting reconstruction capital.

Impact of the war

The following analysis details the operational gap in Banks and Microfinance Institutions (MFIs) in the Tigray region, contrasting key performance indicators from the pre-war period (June 30, 2020) with the post-war resumption of operations.

Impact on Banks' Operations

The analysis of banks reveals a mixed outcome: growth in customer and branch outreach concurrent with a near collapse in lending activity and a dramatic increase in credit risk.

Outreach and Resource Mobilization: Despite the devastating impact of the war, the banks in the region demonstrated a notable resilience in their outreach and resource mobilization efforts. Post-war operations saw banks expand their physical presence by establishing 23 additional branches, reflecting a 5% growth. Concurrently, their customer base increased significantly, with Deposit Customers growing by 9.43% (an addition of 334,541 customers) and Loan Customers increasing by 12.55% (an addition of 1,376 customers). Furthermore, deposit mobilization was strong, with the Total Annual Deposit surging by 42% (an increase of \$96.11 million) to reach \$322.87 million post-war. The most rapid growth was observed in Annual Demand Deposit, which nearly doubled (a 98% increase), contributing to a 17% overall increase in Total Accumulated Deposits, bringing the total to \$1.34 billion. However, this robust success in resource mobilization sharply contrasts with the banks' subsequent lending practices: post-war data indicates that banks lent only 33% of their total deposits within Tigray, suggesting that the vast majority of the mobilized capital continues to be transferred outside the region.

Table 265. Outreach and Resource Mobilization of Banks

Metric	Before War (June 30, 2020)	After War (June 30, 2023)	Gap (Change)
Number of Branches	495	518	5%
Total Annual Deposit	\$226.76 million	\$322.87 million	42%
Total Accumulated Deposits	\$1.14 billion	\$1.34 billion	17%

Source: CITG Survey, 2022

Loan Portfolio and Profitability: The war resulted in the near total collapse of the banks' core lending function, leading to massive financial losses and unprecedented credit risk. Average Annual Loan Disbursement suffered a catastrophic reduction of 96.03%, plummeting from \$126.29 million pre-war to only \$5.02 million post-war. This drastic decline is attributed to various factors, including restrictive new National Bank of Ethiopia (NBE) directives, prevailing security uncertainties, and non-reporting by several major banks. The most devastating impact is seen in the Credit Risk, where the Expected Credit Loss (ECL) witnessed an astronomical increase, rising from a pre-war Non-Performing Loan (NPL) rate of just 0.68% (\$2.67 million) to nearly 69% (\$300.85 million) of the outstanding loan balance post-war. This extreme jump reflects the anticipated massive borrower defaults due to widespread business destruction and instability. The overall consequence of this operational disruption and crippling risk is a staggering financial toll on the banks, comprising Lost Profit of \$173.32 million, the total Expected Credit Loss of \$300.85 million, and Additional Costs amounting to \$14.22 million.

Table 266. Loan Portfolio and Profitability of Banks

Metric	Before War (June 30, 2020)	After War (June 30, 2023)	Gap (Change)
Average Annual Loan	\$126.29 million	\$5.02 million	(96.03%)
Total Outstanding Loan	\$391.61 million	\$436.86 million	11.55%
Expected Credit Loss (ECL)	\$2.67 million	\$300.85 million	11,186%
ECL on Outstanding Loan	0.68%	69%	N/A

Source: CITG Survey, 2022

Impact on Microfinance Institutions (MFIs)' Operations

MFIs demonstrated resilience in deposit mobilization and branch expansion, but like banks, experienced a near collapse in their core lending function, leading to extreme credit risk.

Outreach and Resource Mobilization: MFIs showed modest growth in outreach but exceptional performance in deposit mobilization. Particularly in resource mobilization, despite modest constraints on outreach. The MFIs achieved a slight increase in their physical presence by expanding the Number of Branches by 2.42% and growing their Deposit Customers by 2.46%. However, this growth was offset by a decline in their core function of extending credit,

as the Number of Loan Customers decreased by 4.20%, representing a loss of 15,370 customers. Contrastingly, their Deposit Mobilization was exceptionally strong: the MFIs' Total Annual Deposit grew significantly by 45.27% (an increase of \$17.54 million) to reach \$56.29 million post-war. This remarkable performance was driven by an exponential surge in Annual Demand Deposit, which increased by 1,029%, ultimately contributing to a 46% increase in Total Accumulated Deposits, bringing the total to \$283.88 million.

Table 267. Outreach and Resource Mobilization MFI

Metric	Before War (June 30, 2020)	After War (June 30, 2023)	Gap (Change)
Total Number of Branches	206	211	2.42%
Total Annual Deposit	\$38.75 million	\$56.29 million	45.27%
No. of Loan Customers	365,573	350,203	(4.20%)

Source: CITG Survey, 2022

Loan Portfolio and Profitability: The decline in MFI lending activity mirrors the banks' struggles, severely undermining their interest income and profitability. The war caused the core lending activity of Microfinance Institutions (MFIs) to collapse, severely undermining their interest income and profitability, similar to the struggles faced by the larger banks. The Average Annual Loan Disbursement plummeted by a staggering 94.99%, dropping from \$30.92 million pre-war to just \$1.55 million post-war. This massive reduction in income-generating assets, coupled with the institutions' simultaneous increase in interest-bearing deposits, adversely affected MFI profitability. Furthermore, the Expected Credit Loss (ECL) saw a catastrophic jump of 1,440%, rising from a pre-war Non-Performing Loan (NPL) rate of 1.36% (US\$2.58 million) to 22.49% (US\$39.74 million) of the outstanding loan balance post-war, reflecting the severe disruption and default risk faced by their micro and small enterprise borrowers. The total financial toll on the MFIs includes Lost Profit of \$76.78 million, the total Expected Credit Loss of \$39.74 million, and Additional Costs of \$6.16 million.

Table 268. Loan Portfolio and Profitability of MFI

Metric	Before War (June 30, 2020)	After War (June 30, 2023)	Gap (Change)
Average Annual Loan	\$30.92 million	\$1.55 million	(94.99%)
Expected Credit Loss (ECL)	\$2.58 million	\$39.74 million	1,440%
ECL on Outstanding Loan	1.36%	22.49%	N/A

Source: CITG Survey, 2022

2.6.3 Conclusion and Recommendation

Conclusion

The analysis of the DALA data yields two primary conclusions concerning the war's impact on the Tigray Finance Sector.

Conclusion 1: The Dominance of Liquidity Shock and Credit Market Collapse

The most striking finding is the disproportionate distribution between physical damage (5%) and operational/liquidity losses (95%). This ratio strongly suggests that the primary mechanism of financial destruction was not the wholesale destruction of physical infrastructure (e.g., shelling buildings), but rather the complete collapse of operating capacity and the erosion of assets, a phenomenon that can be categorized as liquidity shock and systemic credit risk.

The 95% loss primarily included lost profits; depletion of capital reserves due to operational shutdowns; and most significantly, unrecovered loans. The prolonged conflict means borrowers could neither access funds nor maintain repayment schedules, leading to the effective default of nearly the entire credit portfolio.

Conclusion 2: Financial Institutions as High-Value Targets for Resource Extraction

The analysis of damage severity reveals that Cash accounts for 41% of all asset damage. This concentration confirms that financial institutions were actively targeted for their immediate liquid wealth. While cash is 41%, the combined technological and administrative capacity — ICT items (16.10%) and FFE (19.16%) — constitutes 35.26% of the damage. This pattern suggests a dual strategy: immediate wealth extraction (Cash) and subsequent functional disablement through the destruction of records, communication systems, and physical work tools. The destruction of ICT is catastrophic, as it hinders the ability to verify ownership, track records, and resume digital operations.

Overall, the DaLA Assessment of the Tigray Finance Sector paints a conclusive picture of financial catastrophe defined by operational collapse rather than physical destruction. The US\$ 644.68 million impact is primarily a consequence of liquidity shock and high-value asset extraction (95% loss, 41% cash damage), indicating a highly targeted conflict strategy aimed at seizing immediate wealth and crippling institutional function via the destruction of ICT systems.

Recommendation

The banks and microfinance institutions in Tigray are highly affected by the Tigray war. Their financial and physical assets are severely damaged, destroyed, and/or looted during the war. Moreover, they incurred substantial loss, in terms of lost profit, expected credit loss, and additional cost. Therefore, for rehabilitation, recovery and reconstruction of the financial institutions, the team proposes the following interventions.

Interventions by Government, Banks, and MFIs

The financial institutions should recover from the effect of the war. Therefore, for the purpose of recovery and reconstruction of the financial institutions in Tigray, the federal government, through the National Bank of Ethiopia, development partners and financial institutions themselves should undertake the following actions:

- a. The banks need to undertake rehabilitation and healing programs to their staff and borrowers in terms of training of staff, customer sensitization programs, and capacity building activities.
- b. The National Bank of Ethiopia should lift the ceiling of the lending rate so that banks can provide more loans to the affected borrowers.
- c. The National Bank of Ethiopia should provide special financial support or liquidity support to the banks and microfinance institutions so that they in turn can waive the borrowers affected by the war from requiring repayment of principal and interest (in part or in full depending on conditions).
- d. The National Bank of Ethiopia should introduce a deposit insurance scheme. A deposit insurance, deposit protection or deposit guarantee is a measure implemented in many countries to protect bank depositors, in full or in part, from losses caused by a bank's inability to pay its debts when due.
- e. In order to prevent looting of cash, banks should fully implement E-banking system such as mobile banking so that no or little physical money is kept in banks.
- f. The recovery process needs to focus on building resilience to the future shocks. Therefore, the government should take the initiation to ensure peace and political stability so that the society at large and the investment or business community build confidence on the market situation.

Intervention on borrowers

The private sector borrowers are among the seriously affected part of the economy. As engine of economic growth and development, the private sector should revive quickly so that it serves the society by providing goods and services. Therefore, in order to rehabilitate and heal from the pain due to the effect of the war and siege, government and development partners should give profound attention to the borrowers which are mainly private investors. The assessment team recommends the following interventions:

- a. Waiver of loans, for both the principal and accumulated interest.
- b. Providing additional fresh loans at concessional interest so that they can easily rehabilitate and start normal operation.
- c. Tax incentives, and other financial and non-financial support mechanisms.
- d. Non-financial support services or business development services (BDS).
- e. Support regarding market access, ensuring the availability of quality inputs, and facilitating transport services, particularly for micro and small business borrowers.

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