Picture credit: A data collector from the Ethiopian Red Cross Society facilitating an FGD in the Abu Chefe settlement of Akaki Sub-city during the endline survey, February, 2026. Photo by Andinet Bekele, Ethiopia Red Cross Society.

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DARAJA

Endline Report

Addis Ababa

March 2026

Outline

1. Objectives
2. Description of the settlement
3. Methods
4. Key findings
5. Summary

Suggested Citation: Resurgence, Ethiopia Red Cross Society & EMI (2026) *Addis Ababa Endline Report—Transforming Urban Weather and Climate Information Services in the East Africa Region through DARAJA.*

In-Text Citation: (Resurgence, Ethiopia Red Cross Society and EMI, 2026)

List of Acronyms

DARAJA	Developing Risk Awareness through Joint Action
EMI	Ethiopia Meteorological Institute
FGD	Focus Group Discussions
IEM	Information Ecosystem Mapping
KII	Key Informant Interview
WCI	Weather and Climate Information
WISER	Weather and Climate Information Services

Objectives

To understand the climate hazards faced by target communities and the impact of the DARAJA project on access, understanding and use of weather and climate information services (WCIS).

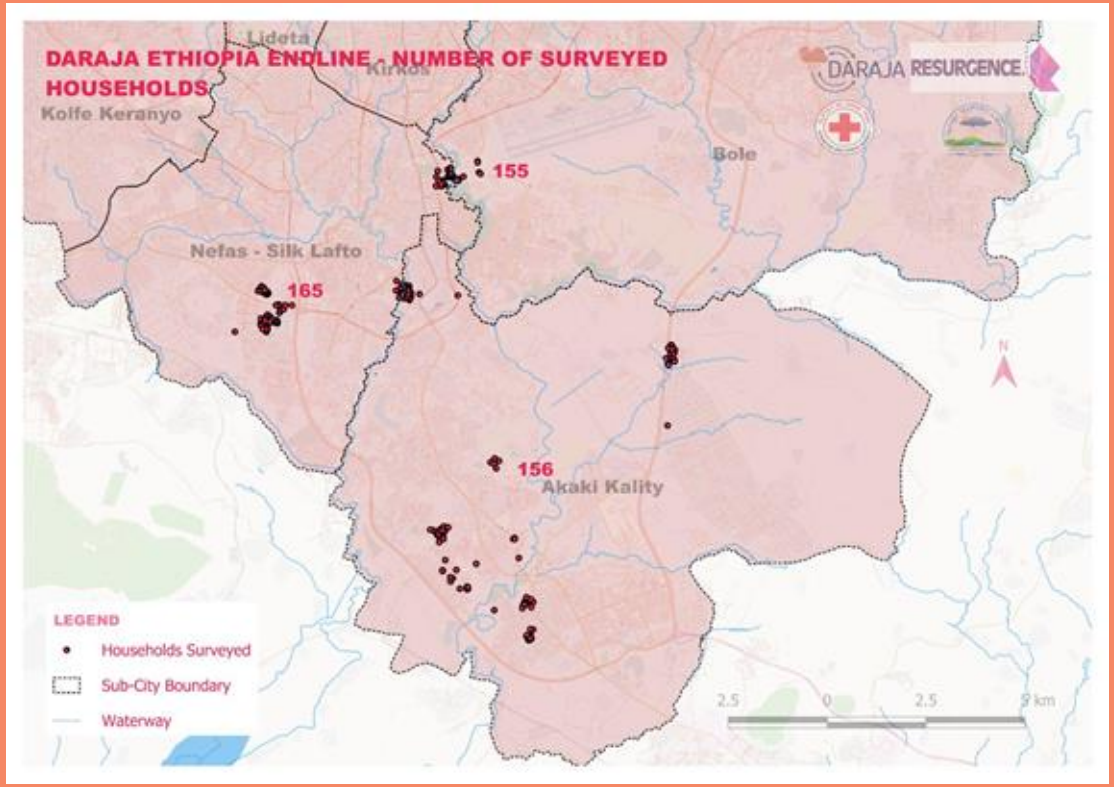
1. To understand the impact of the DARAJA project on access, understanding and use of WCIS by the target communities

2. To assess the project's impact against key indicators

Settlements

Project areas: Akaki and Nifas Silk Lafto Sub-Cities, Addis Ababa

- ➔ Akaki: Abu Chefe, Zeniet, Somali Tefenaqay, Dim Dim Sefer, Gelan Condominium and Mosque sefer
- ➔ Nefas Silk Lafto: Abreamu Selase and Zone 01 Darfur
- ➔ Population sizes:
  - Nefas Silk Lafto (Abreamu Selase – 300 and Zone 01 Darfur – 666): 966
  - Akaki: 146,917
  - Total: 147,883



Control areas

- ➔ Boche (woreda 6) and Oromia Condominium)

- Both settlements are characterised by poor drainage system, with insufficient drainage channels leading to frequent flooding, particularly in low-lying areas

Data collection and data analysis methods

Household Survey	Focus Group Discussions	Key Informant Interviews
476 respondents [321 in project areas (Nifas Silk Lafto & Akaki and 155 in the control area]	**78 participants** across 8 groups (6 in Akaki and 2 in Nifas Silk Lafto)	**10 key informants** 6 in Akaki and 4 in Nefas (6 -male and 4 -female participants)
Male, Female, 18 yrs+, and People with disabilities	43-total female and 35- male participants	Women's Association; Youth Association; Association of people living with disabilities; Fire & Disaster Risk Management Office; Traditional Community Insurance Groups

Quantitative data analysis

Descriptive statistics,
Probit regression model

Qualitative data analysis

Thematic analysis

Key Indicators

% Access

In what ways do people regularly access/ receive weather & climate information (E.g. weather forecasts or warnings)

% Preference

Which channels do respondents prefer to receive weather & climate information

% Understanding

How well the respondents are able to understand the weather & climate information (e.g. forecast)? *(technical details, impacts)*

% Use

How do people use the information they get through different channels i.e. which are the most common preparatory/anticipatory actions taken

Key Findings

Demographic characteristics of respondents

- Female respondents constituted 57% of the total sample, while 43% were male respondents, compared to 68% and 32%, respectively, at baseline
- 82% of respondents have at least a primary-level education (up from 55% at baseline), indicating that most are literate.
- 88% of the respondents do not have any form of disability (vs 82% at baseline), while 11% have some difficulties (same as baseline), 1% have a lot of difficulties (vs 7% at baseline).
- The age group with the most respondents is 31-59 years (74%), followed by 18-30 years (20%) and 60 years and older (6%).
- The average monthly income for most of the respondents (95%) is below 10,000 Ethiopian Birr, consistent with the baseline level (97%).
- Most respondents derive their incomes from casual labour (36%), operating a Kiosk (21%) and formal employment (20%).

% of total respondents **[476]**

Income levels and sources

Average monthly household income (Ethiopia Birr)	Percent		
	Baseline*	Endline	
	Project areas	Project areas	Control
Below 10 000	97	98	89
10 001 – 20 000	2	2	9
Above 20 000	1	0	2

- The average monthly income for most of the respondents is between 0 and 10,000 Ethiopian Birr (with 10,000 estimated to be about US$66.80 as of 03 March 2026).
- Main income sources across all settlements: casual labour (36% vs 30% at baseline), operating a stall or kiosk or roadside vending (21% vs 3.5%) and are formally employed (20% same as at baseline), pension (7% same as at baseline), urban farming (2% vs 4%), and motorbike riding (2% vs 2.5%).

* No data for the control area at baseline

% of total respondents **[194, willing to share income details]**

Housing and Settlement Characteristics

- On average, most respondents have stayed in their current settlements and houses for at least 5 years (45% in project areas and 34% in control area).
- Overall, 35% of respondents live in permanent houses constructed with bricks, cement, and iron sheets, while 32.5% reside in semi-permanent structures and 32.5% live in temporary dwellings made of mud with poor roofing.
- In the project areas, however, the majority of respondents (38%) live in temporary dwellings made of mud with poor roofing. In contrast, in the control area, most respondents (51%) reside in permanent houses
- The majority of respondents (92%) own the houses they currently occupy, with 88% ownership in the project areas and 98% in the control area..
- Most respondents in the control area (83%) reported having lived elsewhere before moving to their current homes, compared with 61% in the project areas. Among those who had relocated, the majority previously lived either in another division of Addis Ababa or in a different house within the same settlement.

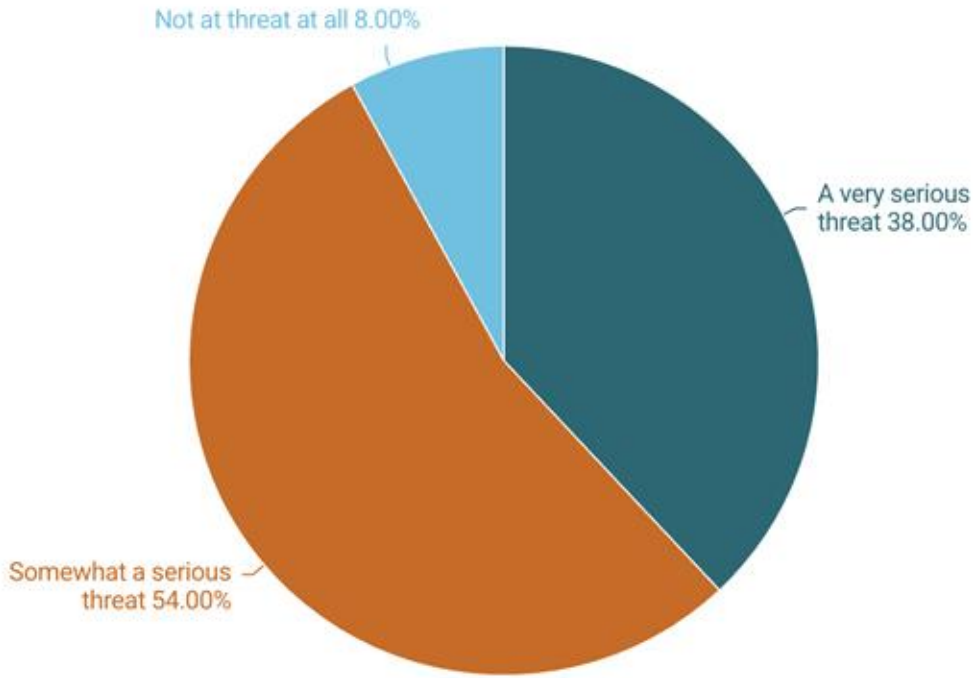
Assets and Livestock Owned

Assets and livestock owned	Percent	
	Project area	Control area
TV	94	92
Radio	60	47
Mobile phone – with internet	24	39
Mobile phone – no internet	32	8
Fridge	42	65
Bicycle	2	6
Fan/other cooling device	0.3	0
Watch	7	15
Motorcycle/Scooter	3	0
Livestock (chickens, goats, sheep)	3	0
Pushcart	1	0

➔ In general, most respondents own a television set (93%), a radio set (54%), a fridge (54%), a smartphone (32%) and a feature phone (20%).

% of total respondents **[476]**

Climate Change a Threat in the Community



Note: Not captured during the baseline survey

- Most respondents (92%) perceived climate change as a threat. In the project areas, 42% viewed it as a **very serious threat** to their community, compared with 30% in the control area.

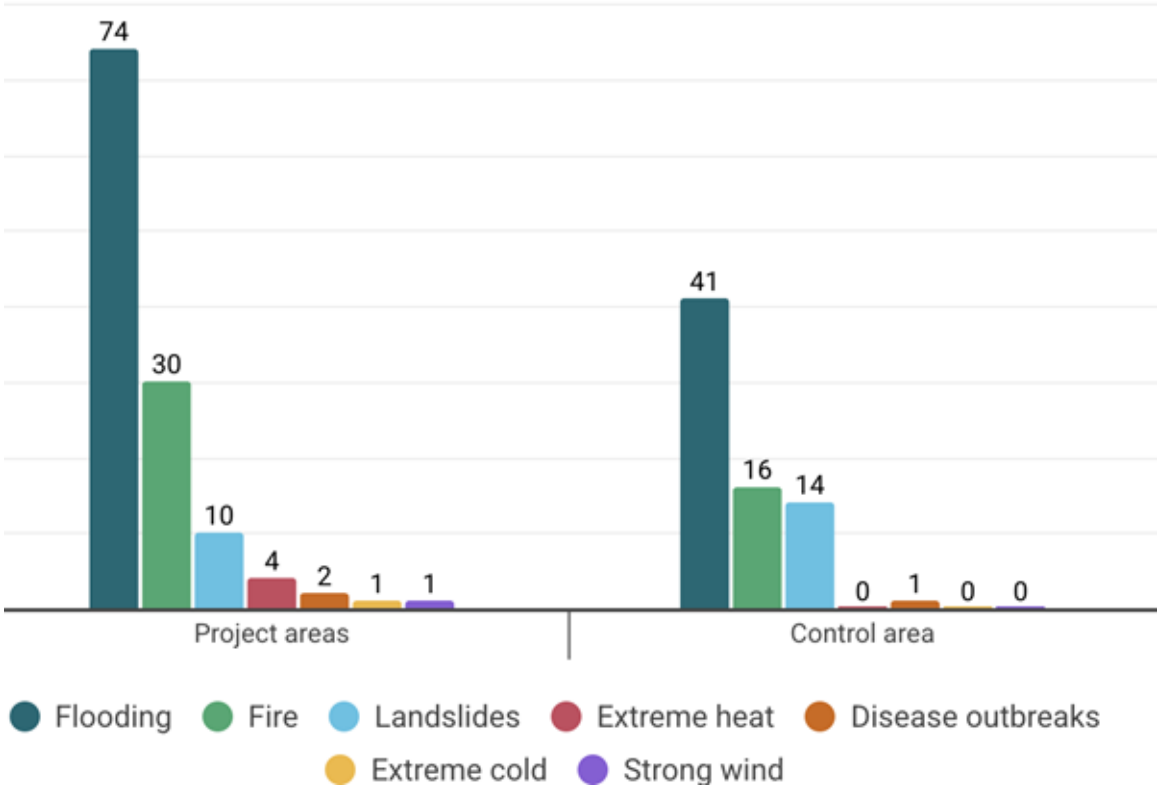
% of total respondents **[476]**

Hazards (1/2)

Flooding remains the most frequent hazard impacting residents across all settlements, with 60% of respondents in the project areas reporting being affected during the past 12 months compared with 36% in the control area.

All the FGD participants identified flooding and rising fire risk as key concerns. *"Flooding is the primary climate hazard, but the resulting electrical fires present a major secondary risk. Compared to these immediate physical threats, extreme heat is not currently perceived as a significant concern."* – [KII, Women Association, Nefas]

Have the following natural hazards ever affected your household? (%)



"Flood and fire are the key hazards of concern in Addis Ababa." - [KII, Fire and Disaster Response Commission, Addis Ababa City]

% of total respondents **[476]**

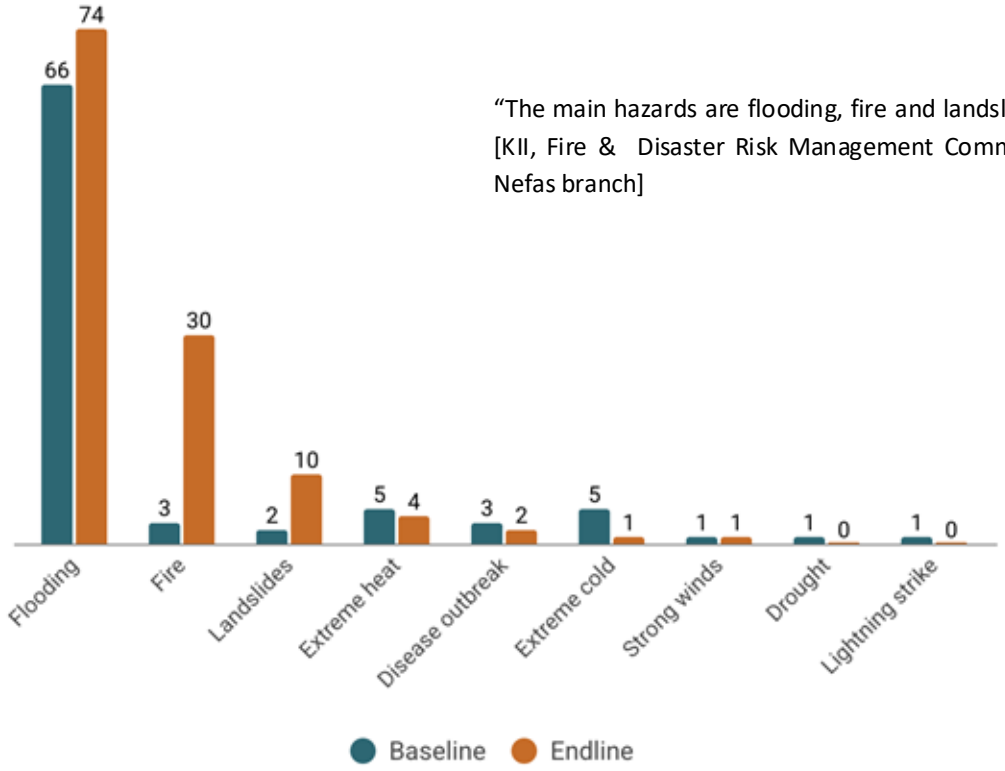
Hazards (2/2)

Flooding remains the most frequent hazard affecting both Akaki and Nefas, with rising fire incidences and landslides reported in both settlements.

Among the affected households, respondents indicated that female household members and those under the age of 18 were the most impacted.

These were primarily affected through sickness caused by drinking contaminated or dirty water (66%), followed by small injuries (22%), significant injuries (6%), and death (4%).

Weather and climate hazards in project areas (Endline vs Baseline)



"The main hazards are flooding, fire and landslides." - [KII, Fire & Disaster Risk Management Commission, Nefas branch]

Although most respondents viewed flooding as a natural occurrence (77%), a notable share attributed it to unplanned infrastructure development (27%), clogged or narrow drainage channels (24%), and poor solid waste management (22%).

% of total respondents **[321]**

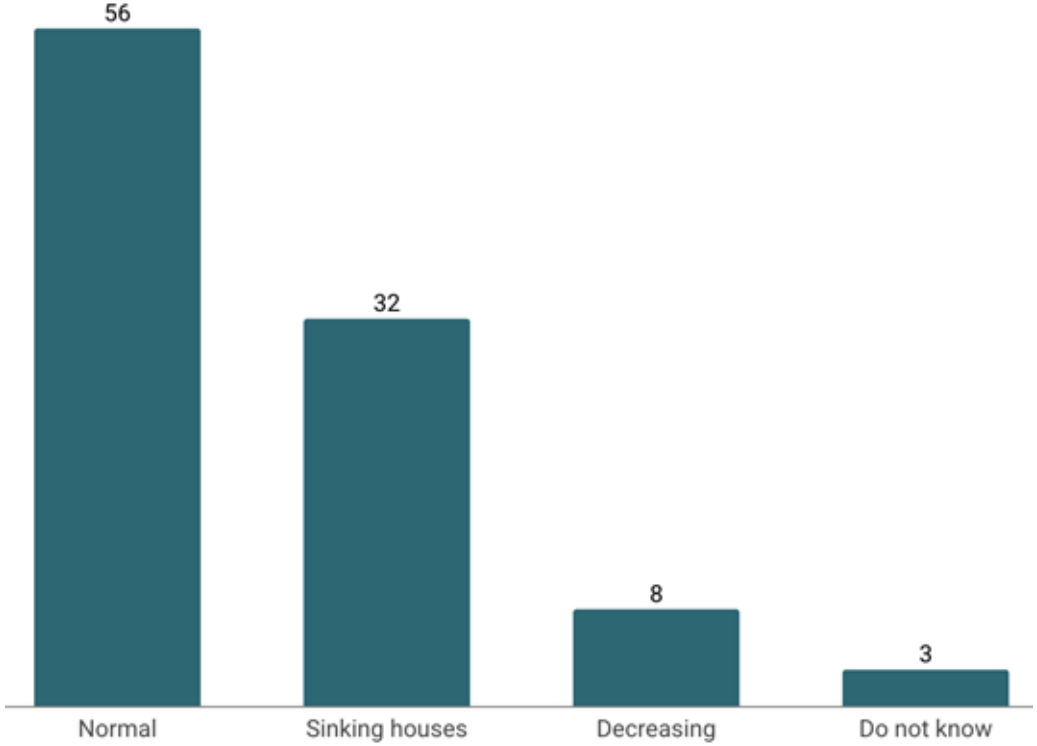
Flooding experience

1 in 3 people generally felt that flooding experience has been increasing over the past five years and affect the wider community

Across all settlements, flooding primarily occurs in July and August, with August experiencing the highest frequency of floods as at baseline.

"The main weather-related hazard in the area is flooding… heavy downpours overwhelm the drainage systems." - [FGD participants in Abreamu Selase]

Flooding experience over the past 5 years (%)



Month	Ja	Fe	Ma	Apr	Ma	Jun	Jul	Aug	Sep	Oct	Nov	Dec
%	2	1	1	0.4	0	11	75	84	2	0.8	0	0

% of total respondents **[102] those affected**

Impacts of flooding (1/6)

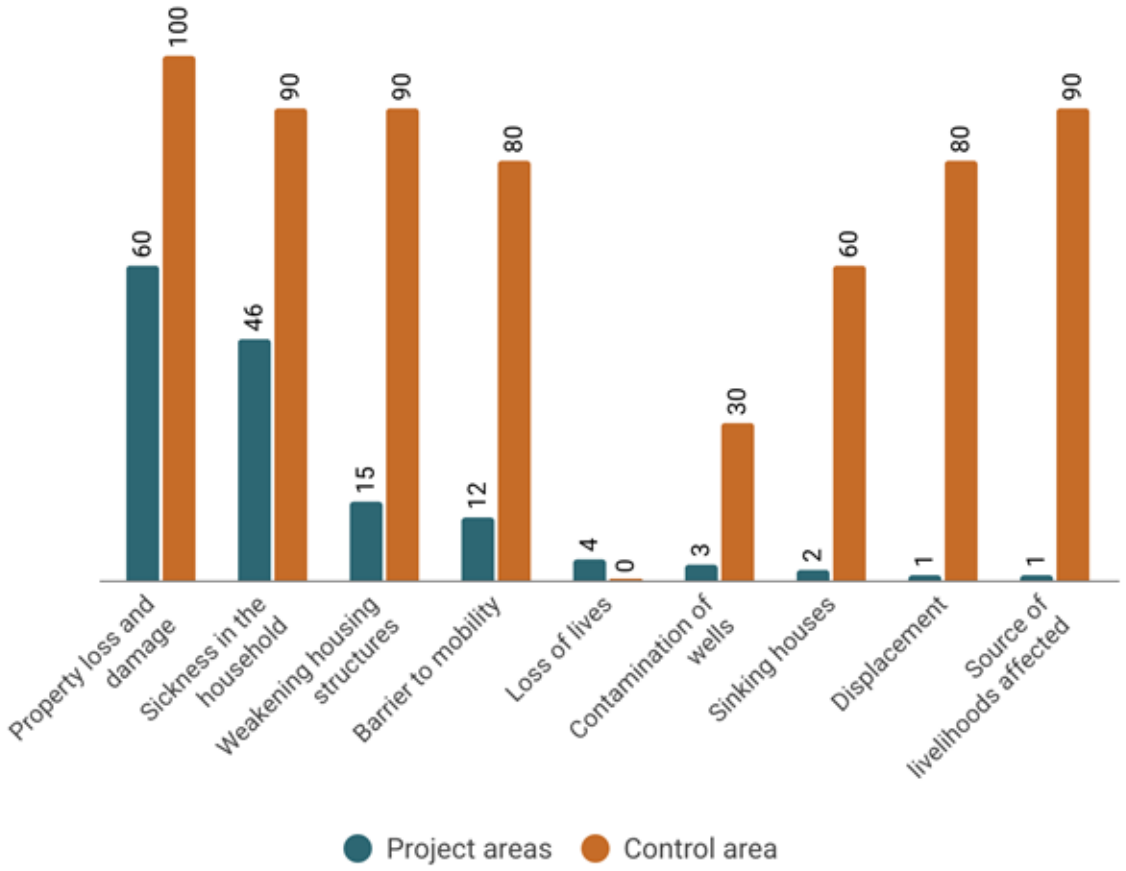
Flooding primarily led to property damage, sickness and weakened house structures

Most respondents in the control area were affected compared to those in the project areas

The FGD participants across all project areas also echoed these findings, identifying loss and damage to property and disruptions in mobility, livelihoods, and schooling, as well as health risks from contaminated water, as key impacts of flooding.

Addis Ababa Endline Survey Data Results- February 2026

Impacts of flooding (%)



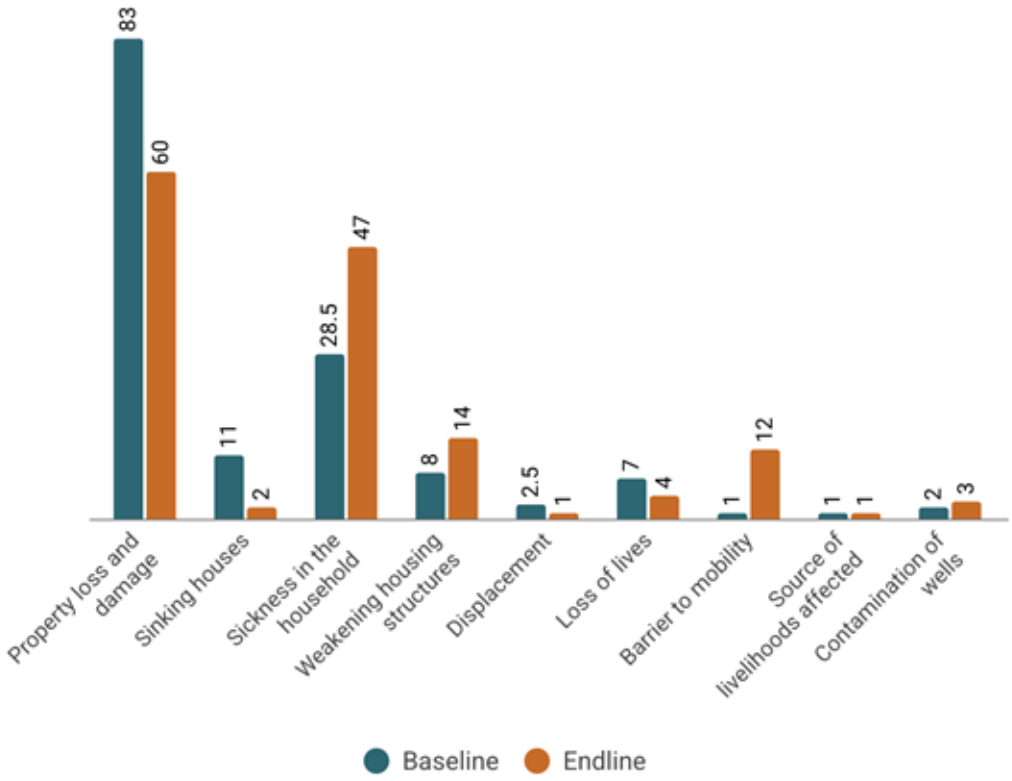
% of total respondents **[102] those affected**

Impacts of flooding (2/6)

Major improvements in severe impacts: big drops in property loss & damage, sinking houses, displacement, and loss of lives suggest stronger preparedness and better early warning and action

Rising secondary impacts: however, sickness in households, barriers to mobility, weakening structures, and contamination of wells increased—pointing to WASH, health, and access issues that still need attention.

Impacts of flooding in project areas (%) [Endline vs Baseline]



% of total respondents **[92] those affected**

Impacts of flooding (3/6)

Statistical significance analysis of flood impacts between the project areas and the control area

Main impacts	Percent			
	Overall	Control area	Project areas	Difference
Loss of property (1 – Yes, 0- No)	64	100	60	40**
Loss of lives (1 – Yes, 0- No)	4	0	4	-4
Sickness in the household (1 – Yes, 0- No)	50	90	46	44***
Sinking houses (1 – Yes, 0- No)	8	60	2	58***
Contamination springs/wells (1 – Yes, 0- No)	5	30	3	27***
Barrier to mobility (1 – Yes, 0- No)	19	80	12	68***
Weakening structures (1 – Yes, 0- No)	23	90	15	75***

Households in project areas experienced significantly less severe flood impacts than those in the control area—providing strong evidence that the project materially reduced the consequences of flooding

- ➔ Across 6 of 7 indicators, the project areas report substantially fewer flood impacts than the control area, with statistically significant differences.
- ➔ For example, while all respondents in the control area reported property loss, only 60% of respondents in the project areas experienced the same. This 40-percentage-point difference is statistically significant ($p < 0.05$).
- ➔ The only exception is loss of lives, which shows no significant difference.

**** p<0.01, ** p<0.05, * p<0.1*

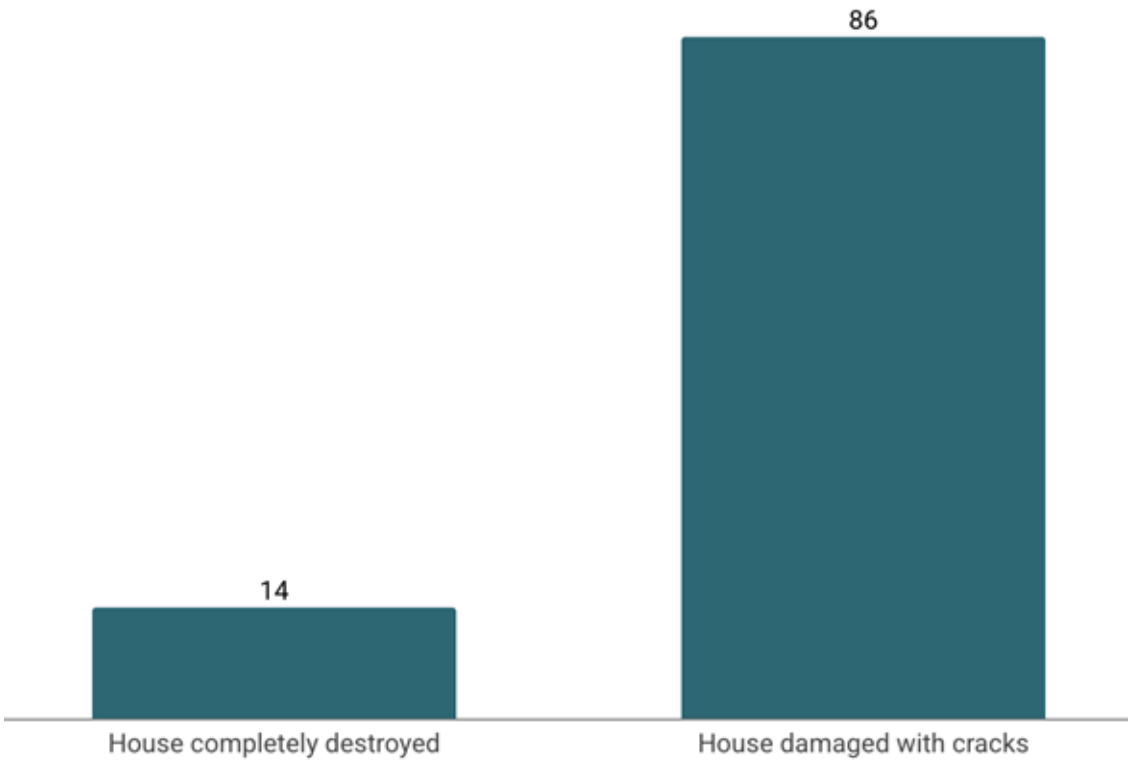
% of total respondents **[476]**

Impacts of flooding (4/6)

Among households that reported property damage and weakening structures, 86% said their houses were damaged, and 14% indicated their houses were completely destroyed

"Beyond the damage to our homes, the flooding creates a mobility crisis; the access roads become impassable, meaning we have no way to walk out of the neighborhood. This has a ripple effect on our lives—children miss school, and adults are frequently late to work, which strains our finances as we lose income and have to pay for constant home repairs." – [FGD participants, Mosque Sefer, Akaki]

How properties were affected by flooding (%)



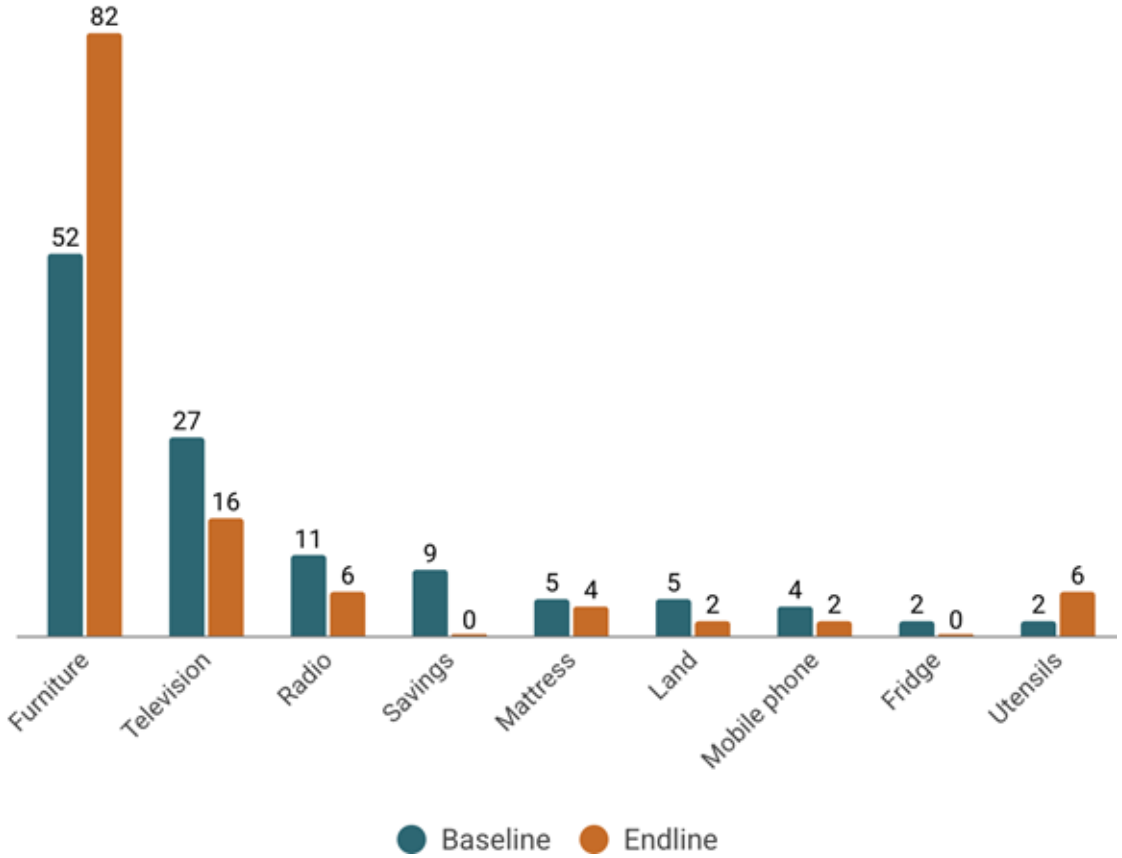
% of respondents with houses affected **[50]**

Impacts of flooding (5/6)

Although most households reported losing furniture and utensils, losses across all other asset categories declined

"Our most pressing concern is flooding, which disproportionately affects our members. We face a higher risk because we cannot evacuate as quickly as others; therefore, receiving early warning information is a matter of survival for our members." – [KII, Association of Persons with Disabilities, Akaki]

Assets lost due to flood in project areas (%) [Endline vs Baseline]



% of respondents affected **[50]**

Impacts of flooding (6/6)

Most respondents lost assets valued below 5000 Ethiopian Birr

Value assets lost due to flooding in project areas (%) [Endline vs Baseline]

Value of assets lost	Baseline	Endline
Below 5,000	46	76
5,000-20,000	34	22
20,001-40,000	14	2
40,001-60,000	2	0
Above 60,001	4	0

% of total respondents **[50] those affected**

Costs of cleaning the house after flooding

The flooding duration mostly last for about 2 hours

The majority of respondents (**84%**) in the project areas incurred costs below 2,000 Ethiopian Birr to clean their homes after flooding. In the control area, none of the respondents reported incurring any cleaning costs following flooding.

% of costs incurred to clean the house after flooding

Cost incurred to clean a house after flooding	Project areas	Control area
Below 2,000 Birr	84%	0
2,000-4,000 Birr	10%	0
4,001-6,000 Birr	4%	0
6,001-8,000 Birr	2%	0

% of total respondents **[50] among those affected**

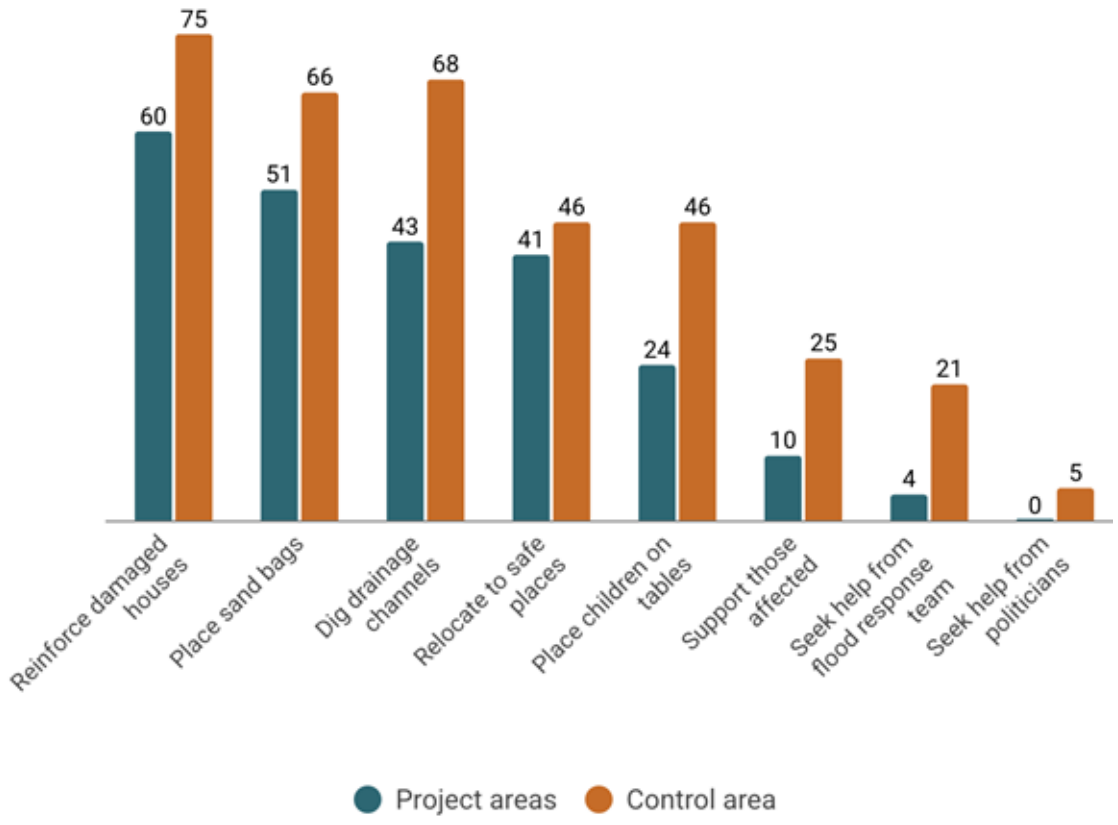
Coping strategies (1/2)

At the household level:

1. Reinforce damaged houses,
2. place sandbags around the household structure and doorways to prevent water from entering.
3. dug drainage channels

At the community level: most residents clear drainage channels (75%), level the compound/cover ditches to prevent water from stagnating around houses (72%), expand drainage channels (60%), and dig new drainage channels (45%).

Flooding coping strategies (%)



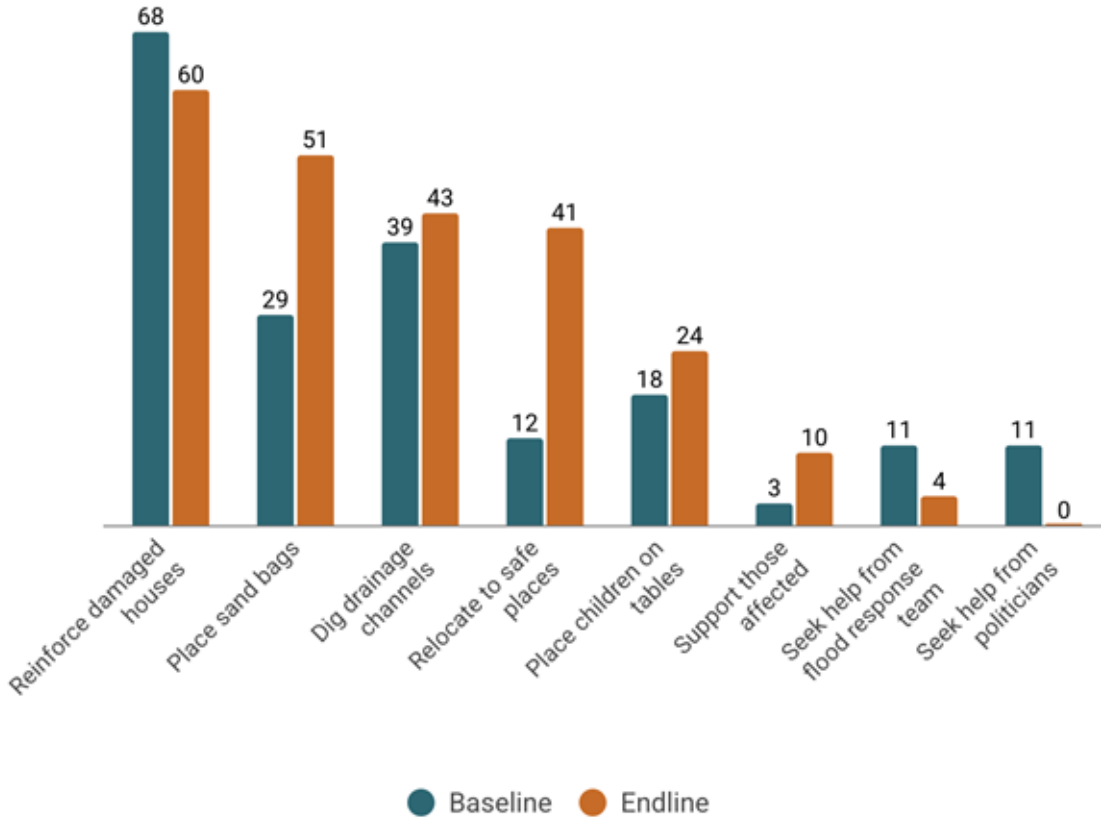
% of total respondents **[247], those affected by flooding**

Coping strategies (2/2)

At the household level:

1. Reinforce damaged houses,
2. place sandbags around the household structure and doorways to prevent water from entering.
3. dug drainage channels

Flooding coping strategies in project areas (%) [Endline vs Baseline]

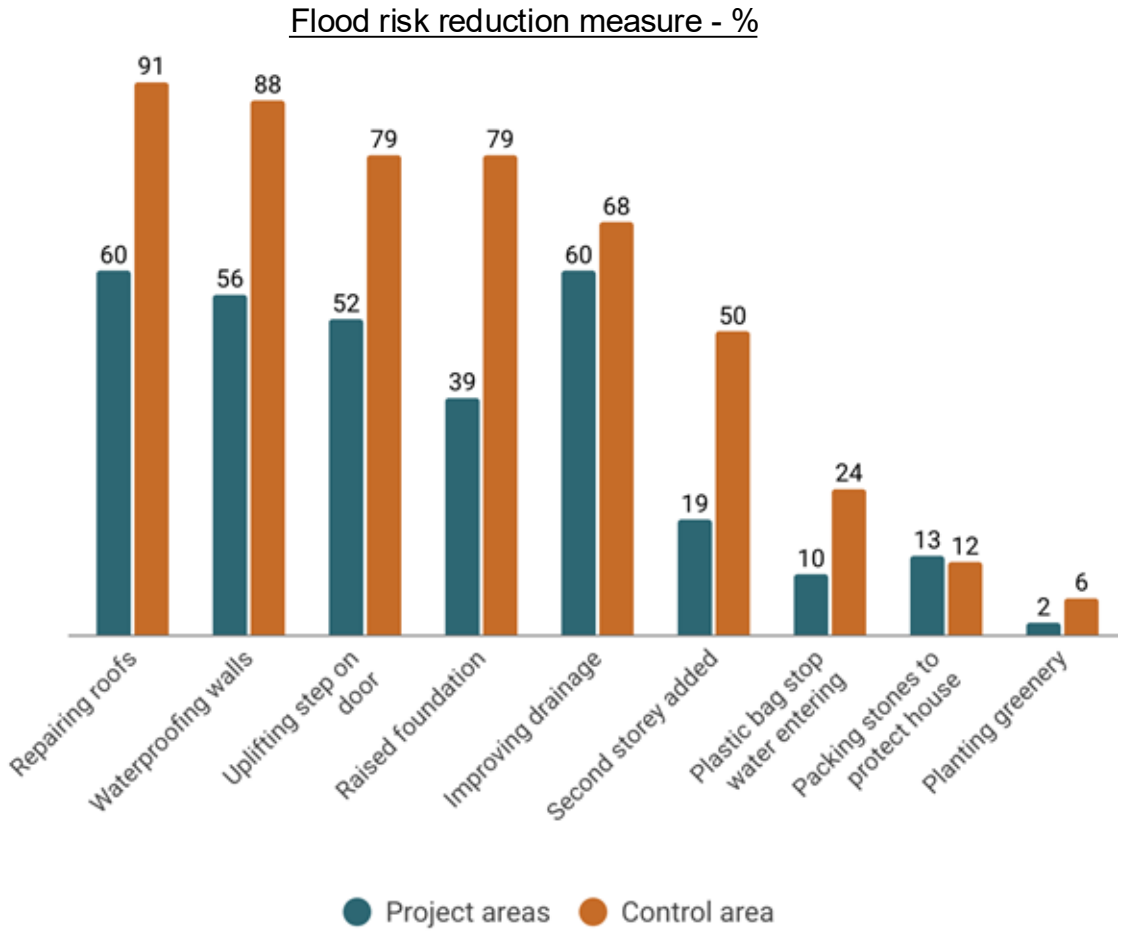


% of total respondents **[191], those affected by flooding**

Flood risk reduction measure – household level

Most households adopted flood risk reduction measures (64% in project areas vs 61% in the control area).

The main risk-reduction measures implemented included repairing roofs, improving drainage, waterproofing walls, and raising doorsteps to prevent water from entering the house.



% of respondents implemented flood risk reduction measure **[247]**

Costs of implementing risk reduction measure

Most households incurred costs in implementing flood risk reduction measures (78% in project areas vs 21% in the control area).

% of costs incurred in implementing flooding risk reduction measure

Cost incurred to in implementing flooding risk reduction measure	Project areas	Control area
Below 10,000 Birr	81%	100
10,000-30,000 Birr	18%	0
30,001-50,000 Birr	1%	0
Above 50,000 Birr	0	0

Most respondents (55%) reported that the flood risk reduction measures were existing measures, while 39% indicated they were retrofits

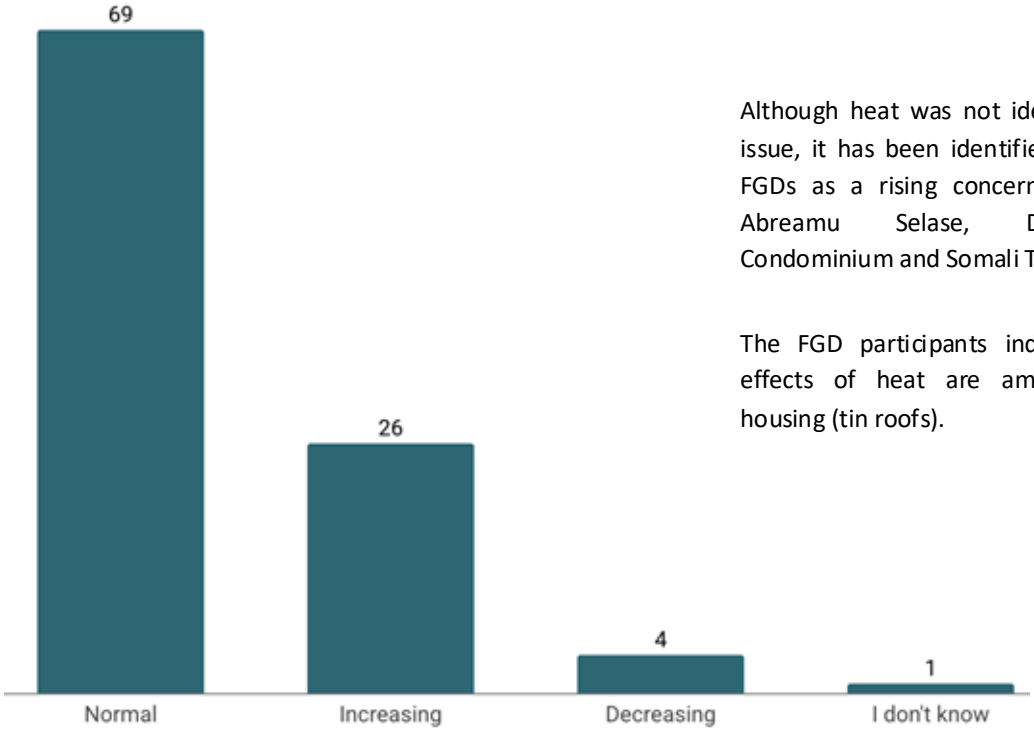
% of total respondents **[156] among those incurred costs**

Heat experience

Although more than half of the respondents perceived heat levels over the past five years as normal (no change), **25%** reported experiencing heat in the past 12 months (all from project areas)

Among those who experienced heat in the past 12 months, most (59%) reported feeling it between January and April, with February, March and April identified as the hottest months.

Heat experience over the past 5 years (%)



Although heat was not identified as a key issue, it has been identified by 4 out of 8 FGDs as a rising concern, particularly in Abreamu Selase, Darfur, Gelan Condominium and Somali Tefenakay.

The FGD participants indicated that the effects of heat are amplified by poor housing (tin roofs).

Month	Ja	Fe	Ma	Apr	Ma	Jun	Jul	Aug	Sep	Oct	Nov	Dec
%	46	64	55	52	45	8	4	7	0	0	3	18

% of total respondents **[476]**

Impact of extreme heat (1/6)

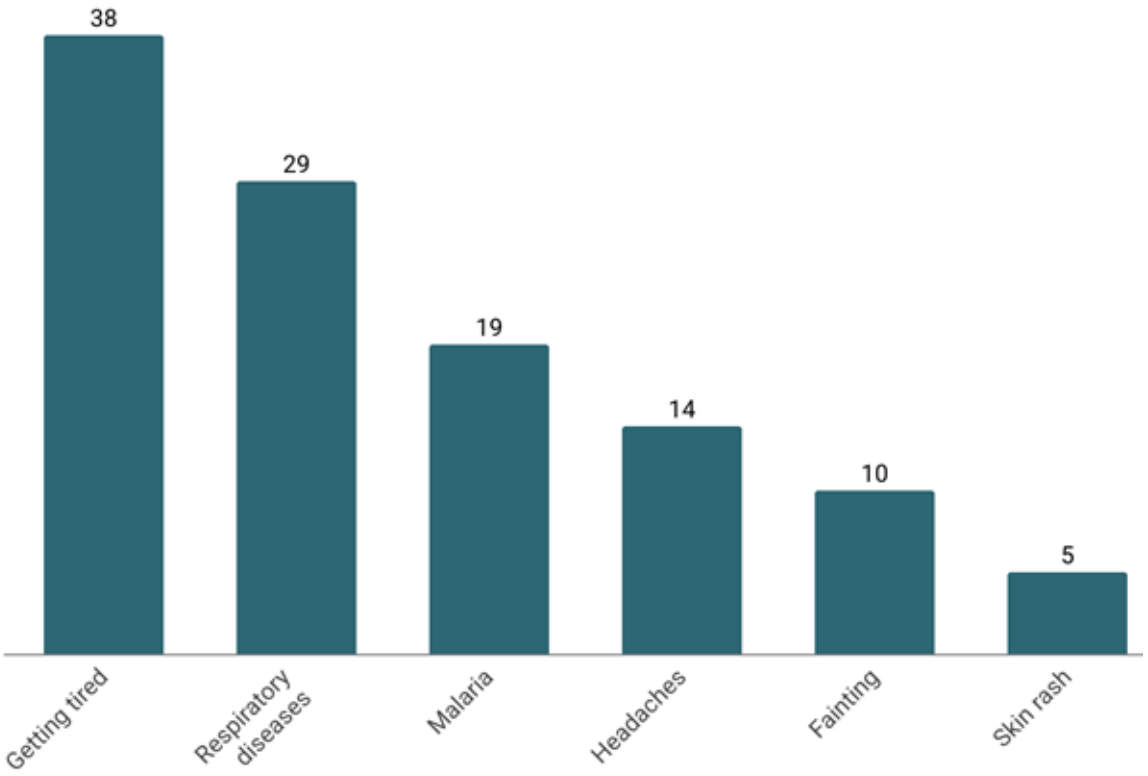
Among those who experienced heat during the past 12 months, **17%** indicated that their households have been affected by heat across all settlements.

The most notable effects of heat among those affected were fatigue, respiratory illnesses, and increased cases of malaria.

The FGD participants also confirmed these impacts: headaches; dizziness; exhaustion; reduced productivity, especially during midday; and food spoilage.

"Tin roofs amplify indoor heat, rendering homes uninhabitable." - [FGD participants in Darfur]

How household members were affected by heat (%)



% of respondents affected by heat **[21]**

Impact of extreme heat (2/6)

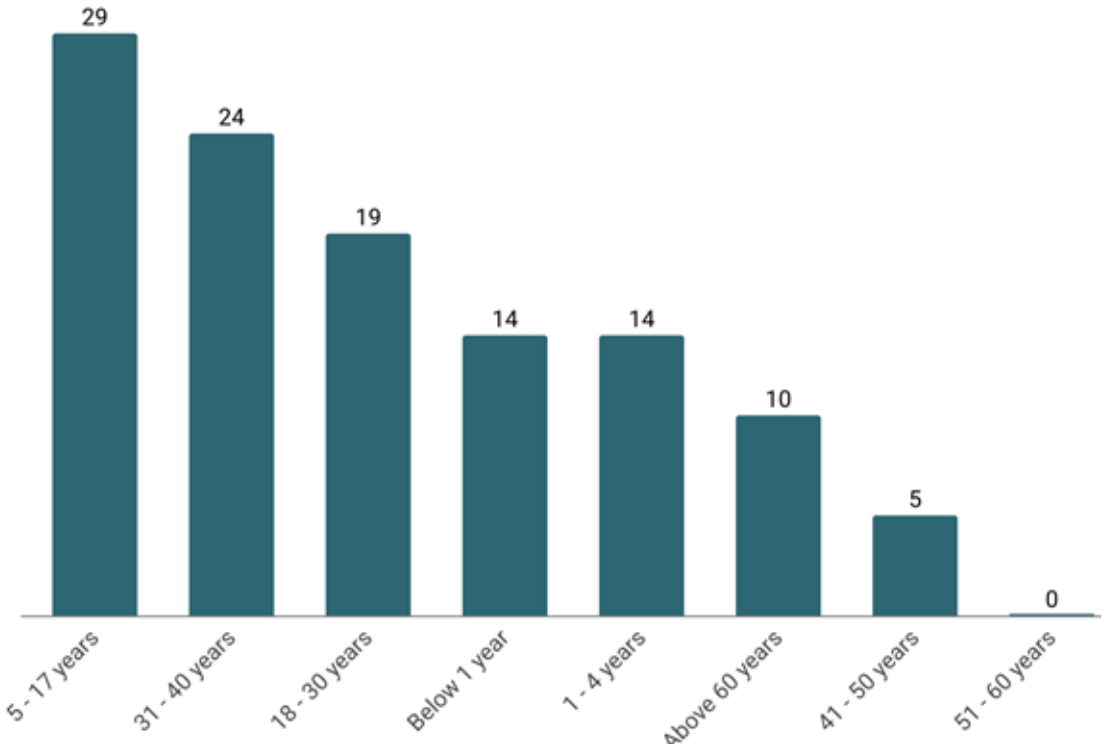
Young children (5-17 years) appear to be the most vulnerable to heat effects, likely due to school activities.

Adults aged 31 – 40 years also report relatively high exposure, likely due to outdoor activities or work

In terms of gender, the most affected were females (**81%**)

While 71% of people without disabilities reported being affected, **29%** of those with some disabilities were also affected.

Age group most affected by heat (%)



Infants and elderly people (60+) report fewer cases, but this might reflect a smaller proportion of households with elderly people in the sample, rather than lower vulnerability

% of respondents affected by heat **[21]**

Impact of extreme heat (3/6)

Among those affected by heat, **86%** incurred costs seeking medical treatment

Most respondents incurred costs below 10 000 Ethiopian Birr

Cost incurred seeking medical attention or treatment because of heat (%)

Cost (Ethiopian Birr)	Percent
Below 10 000	72
10,000 - 20,000	11
20,001 - 30,000	11
30,001 - 40,000	6

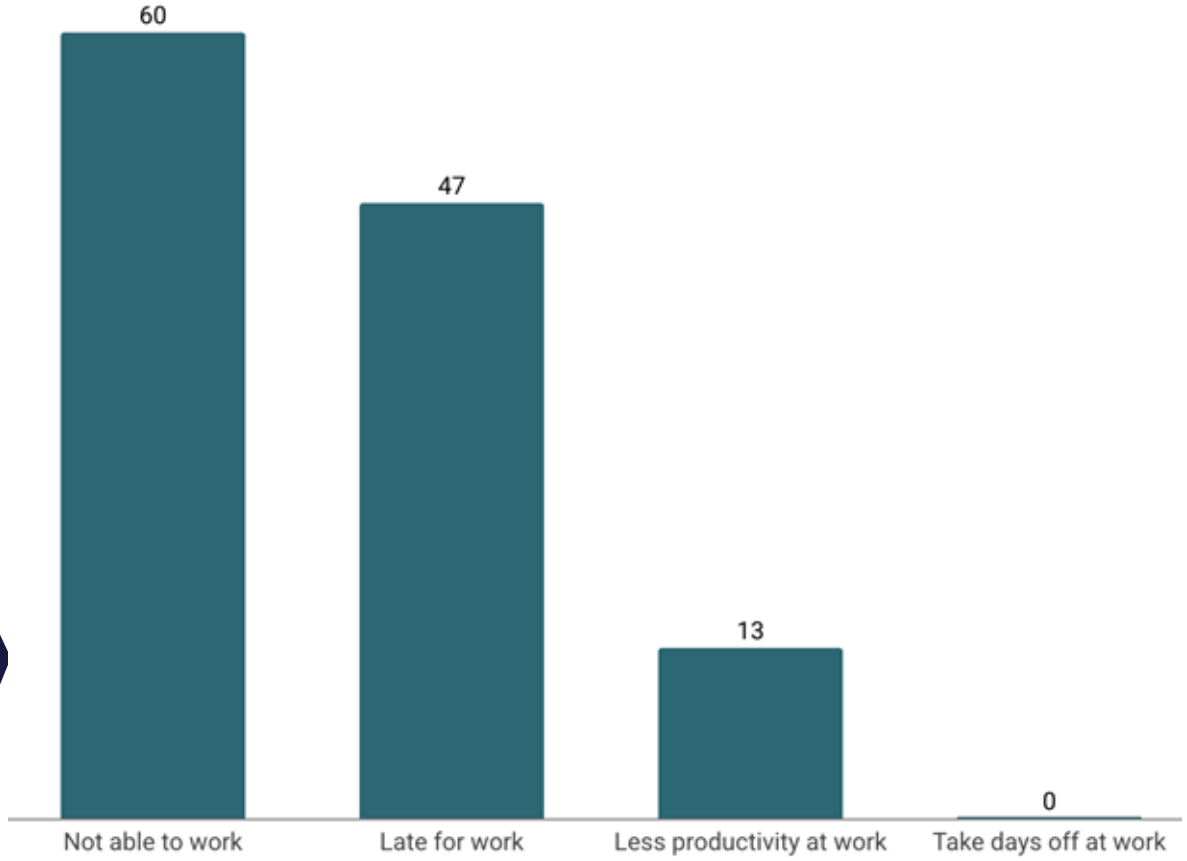
% of respondents affected by heat **[21]**

Impacts of extreme heat (4/6)

Among those affected, most respondents (71%) indicated that their ability to work was affected by the heat.

Most were not able to work due to the heat

How ability to work was affected by heat (%)



% of respondents who their ability to work was affected by heat **[15]**

Impacts of extreme heat (5/6)

Among respondents affected by heat, 80% indicated that they lost income due to the heat

Most of them experienced income loss of between 10 000 and 20 000 Ethiopian Birr

Income lost due to heat effects (%)

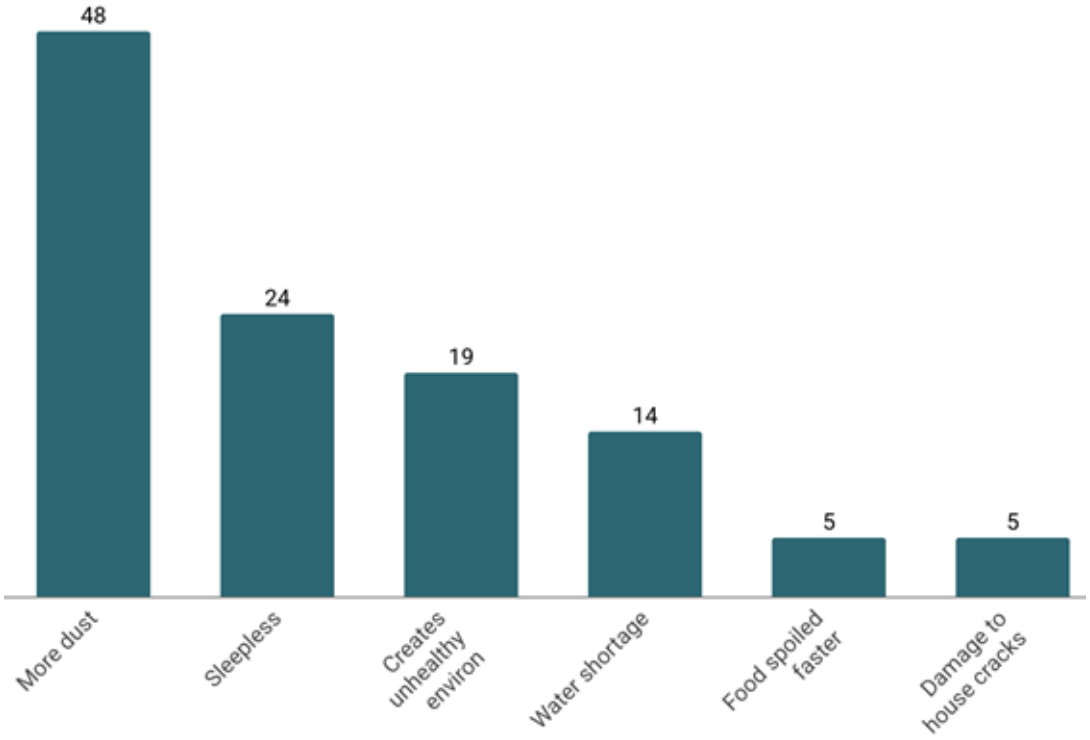
Income (Ethiopian Birr)	Percent
Below 10 000	67
10,000 - 20,000	25
20,001 - 30,000	8
30,001 - 40,000	0
40,001 - 50,000	0
50,001 - 60,000	0
Above 60,000	0

% of respondents who lost income due to extreme heat **[15]**

Impacts of extreme heat (6/6)

Daily life disruptions: more dust and widespread sleeplessness.

Other impacts of extreme heat (%)



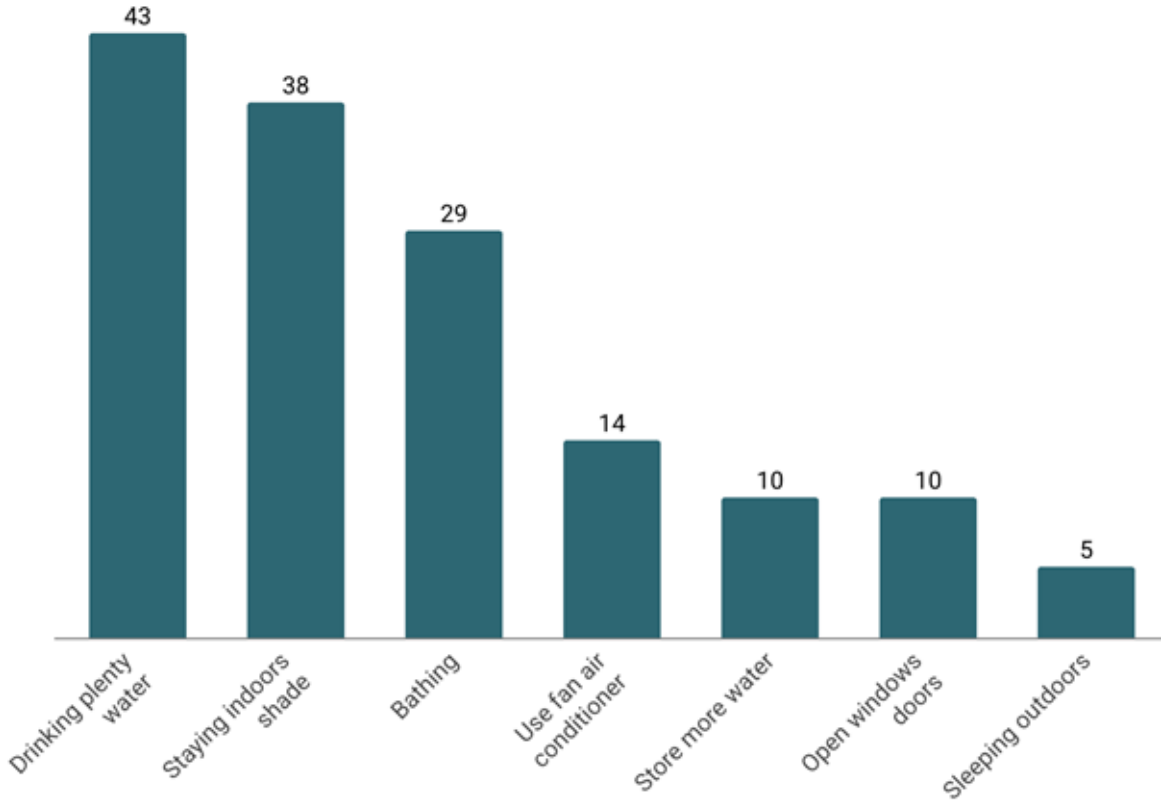
% of respondents affected by heat **[21]**

Extreme heat coping strategies

Main heat coping strategies:

- Drinking plenty of water, staying indoors or under shade and bathing

How households are coping with extreme heat (%)



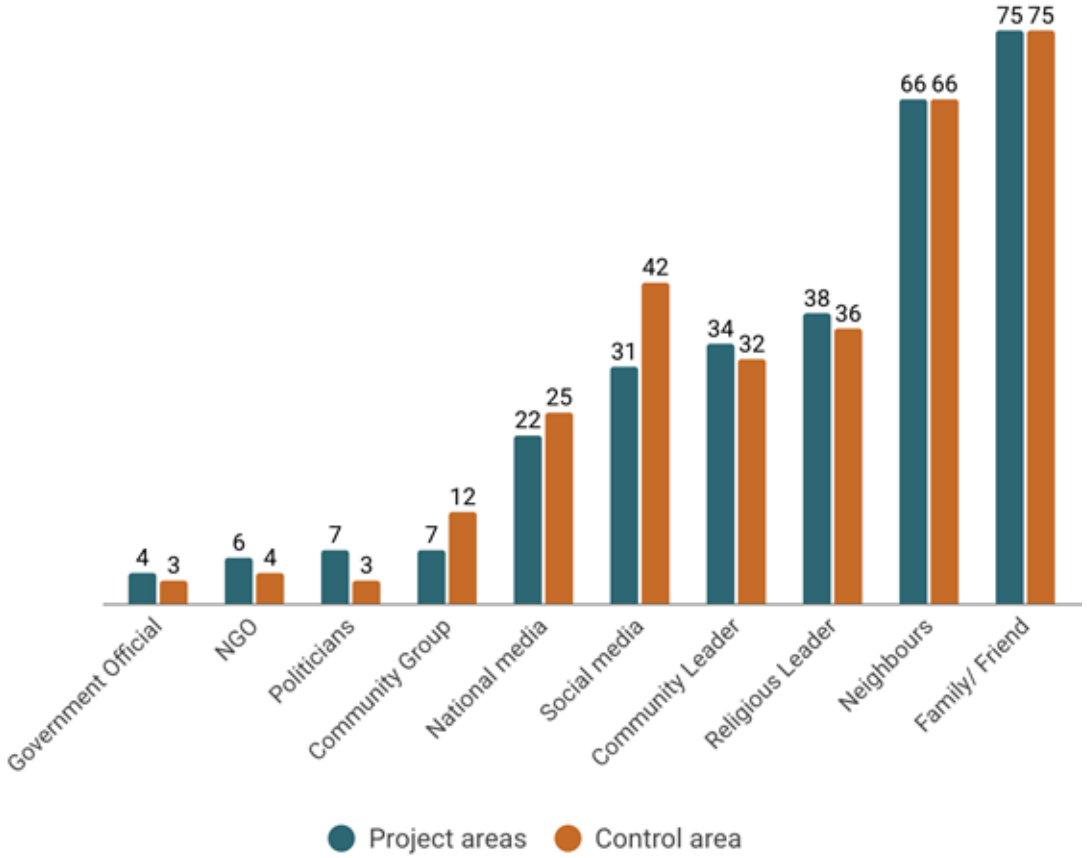
% of respondents affected by heat **[21]**

Access to general Information (1/4)

Just like at baseline, family members/friends and neighbours are the main sources of general news

Family and friends remained the most trusted sources of general information, consistent with baseline.

Sources of general news

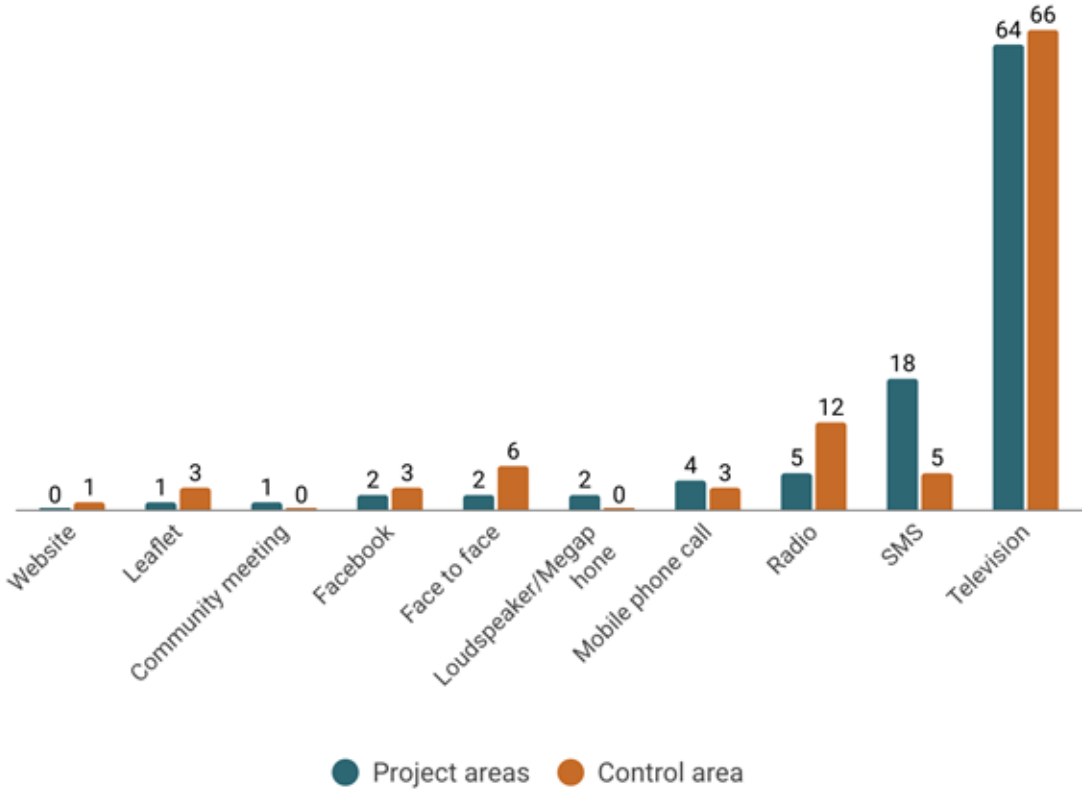


% of total respondents **[476 respondents]**

Access to general Information (2/4)

Television is the preferred source of general information across all settlements

Preferred sources of general news

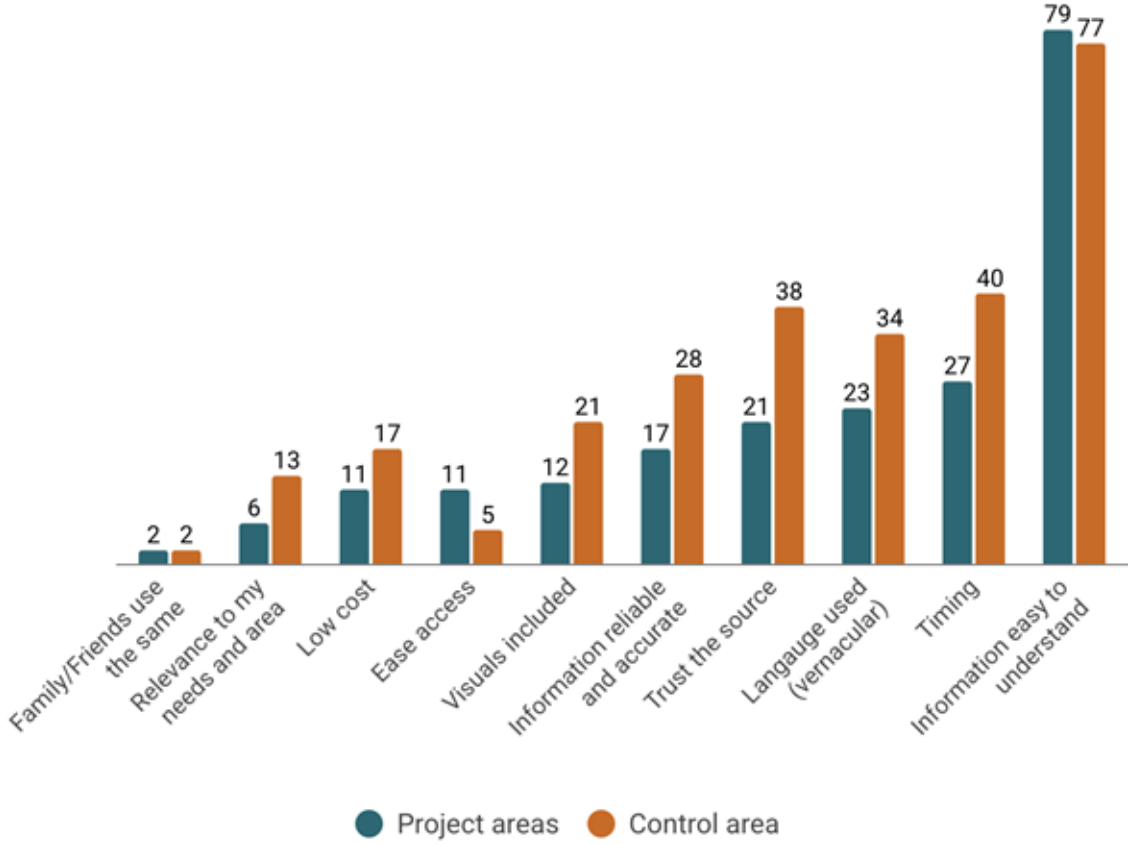


% of total respondents **[476 respondents]**

Access to general Information (3/4)

The main reasons for choosing the preferred channel were that the information was easy to understand and the timing of when it was received

Reasons choosing the preferred sources of general news (%)



% of total respondents **[476 respondents]**

Access to general Information (4/4)

- **54%** (vs 42% at baseline) have access to a working radio, and they listen to the radio mostly at home (78%), every day (47%), at night (36%) & during the morning (33%).
- Most respondents listen to FM Addis 97.1 (47%) and Sheger FM 102.1 (42%).
- Other radio stations: Fana FM 98.1 (8%) and Addis Media Network 96.3 (3%)

- **93%** (vs 77% at baseline) of the respondents have access to a working television, and they watch television mostly at night (30%) and in the morning (26%), every day (36%), and at home (97%).
- The most-watched television channel is ETV (86%), followed by EBS TV (68%) and Fana TV (54%).
- Other television channels: Abay TV (43%), Addis TV (15%), Walta TV (14%) and Arts TV (1%)

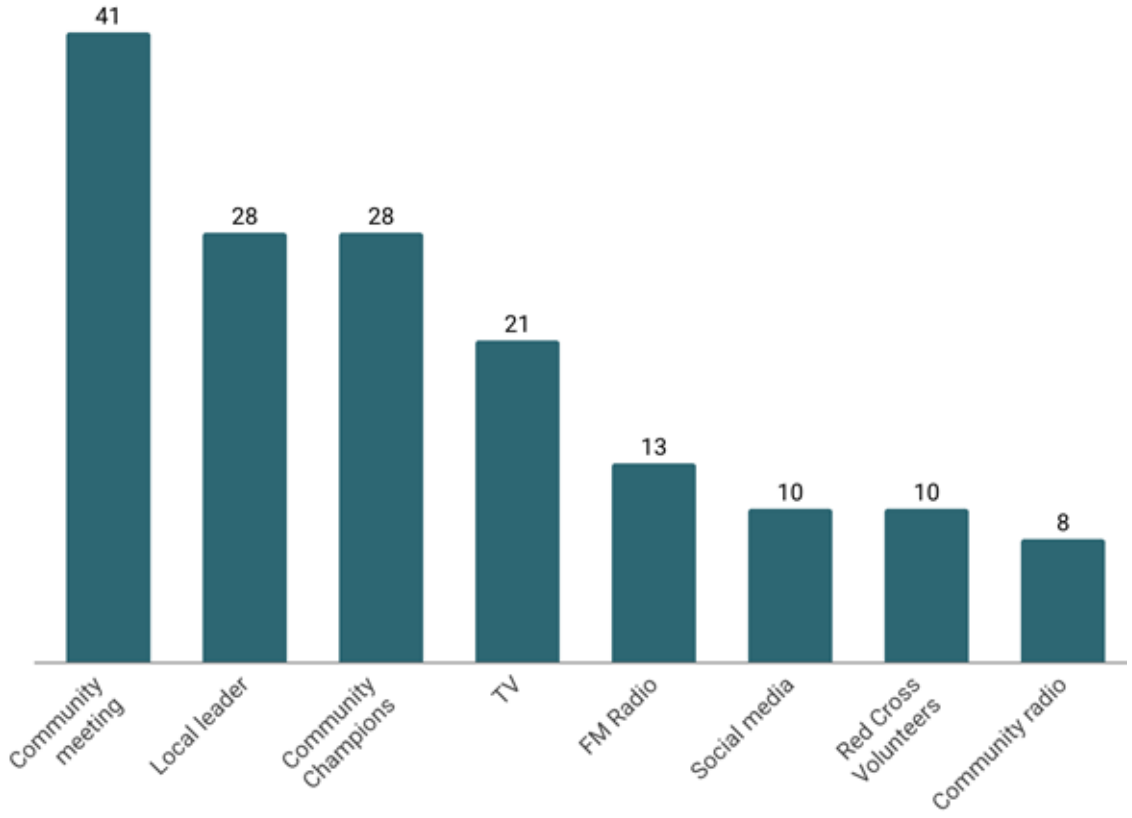
% of total respondents **[476 respondents]**

Access to WCI
Awareness of DARAJA

67% of respondents in the project areas were aware of the DARAJA project in Addis Ababa.

Most of them first heard about DARAJA from community meetings, local leaders and community champions

How respondents first heard about DARAJA (%)



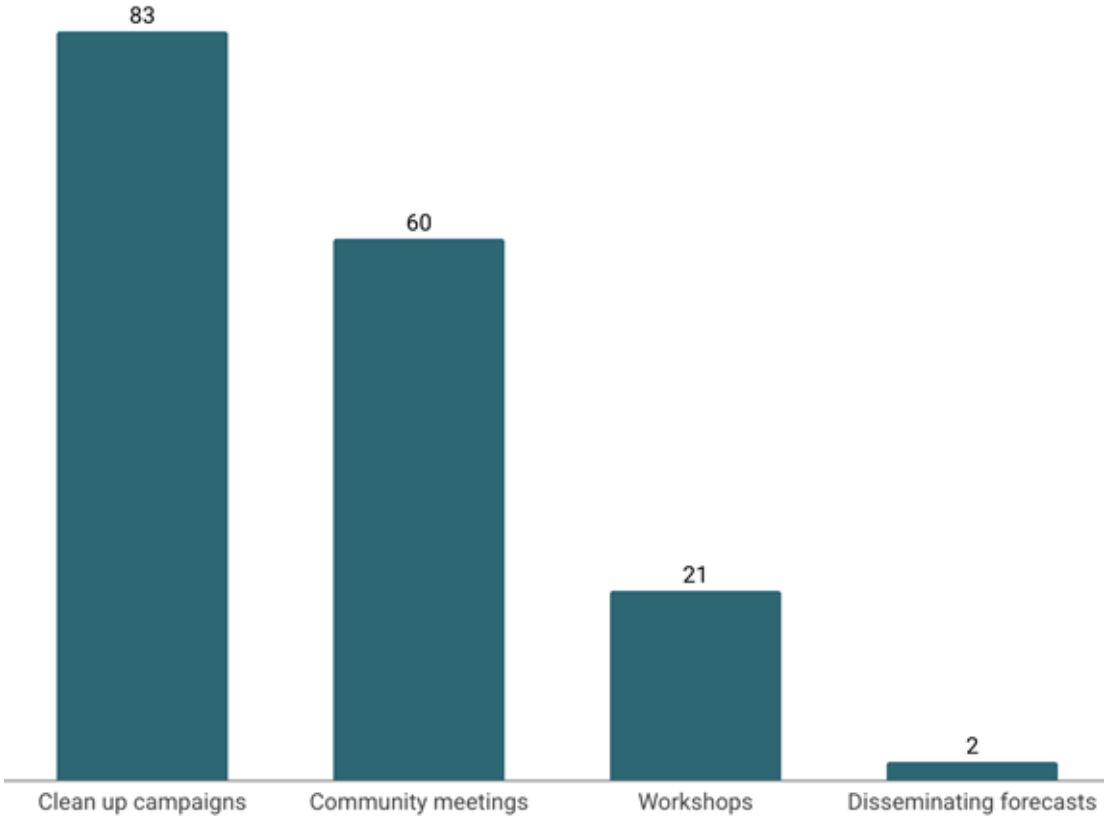
% of total respondents **[214 respondents] aware of DARAJA**

Access to WCI
Participation in DARAJA activities

Among those who were aware of it, **58%** participated in DARAJA activities.

Most of them participated in cleanup campaigns and community meetings.

Which DARAJA activities have you participated in (%)



% of total respondents participated in DARAJA activities **[124 respondents]**

Access

Access to WCI in the project areas increased from 42% at baseline to **50%** at endline (Akaki: 58% vs 44%; Nefas: 42% vs 40%), indicating a positive project impact on strengthening access to early warning and weather forecast information.

In the control area, 61% of respondents reported having access to WCI*.

All the FGD participants also indicated that they have access to WCI.

Overall, the project reached 73,942 people with WCI

**Note: No data for the control area at baseline*

Access to weather and climate information (WCI) in project areas

Percentage of respondents who:	Baseline	Endline
access WCI	42%	50%
If access**, share the WCI**	57%	76%
If access: a. **Daily**	35%	50%
b. **Every few days**	20%	36%
c. **In real-time**	16%	14%
d. **Weekly**	16%	5%
e. **For high-impact events**	13%	1%
f. **Monthly**	8%	1%

Among those who accessed WCI, daily forecast access increased from 35% at baseline to 50% at endline, reflecting the impact of the new daily forecast developed through DARAJA by EMI. Sharing WCI also increased from 57% to 76%, mainly with family members, friends and neighbours.

[% of total respondents **321**] in project areas

Access:
Gender, age, disability and settlement

Access to WCI by gender, age and disability status

- Access to WCI increased for both men (**60%** vs. 49% at baseline) and women (**43%** vs. 39%), though men still reported slightly higher access.

- Access to WCI increased across all age groups, with the largest increase among respondents aged 18-30 years (**55%** vs. 19% at baseline). Access also improved among those aged 31–59 years (**51%** vs. 46%) and 60+ years (**31%** vs. 24%)

- From a disability perspective, access to WCI improved for both groups: **51%** of respondents without difficulties (vs. 43% at baseline) and **43%** of those with some or a lot of difficulties (vs. 33%)

% of total respondents **[321]**

Access to WCI

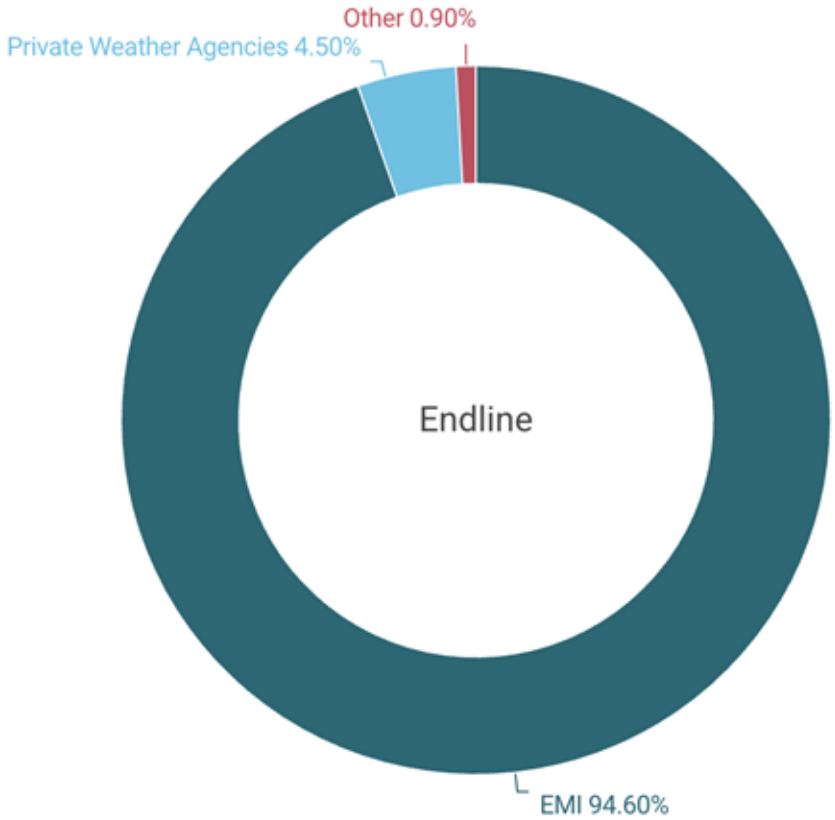
Aware of the source

69% of respondents with WCI access in project areas know the source, vs **57%** in control areas.

Among them, **94.6%** indicated the Ethiopian Meteorological Institute (EMI) as the source of WCI

"We receive the forecasts from the Ethiopian Meteorological Institute." - [FGD participants in Somali Tefenakay]

Source of WCI in project areas

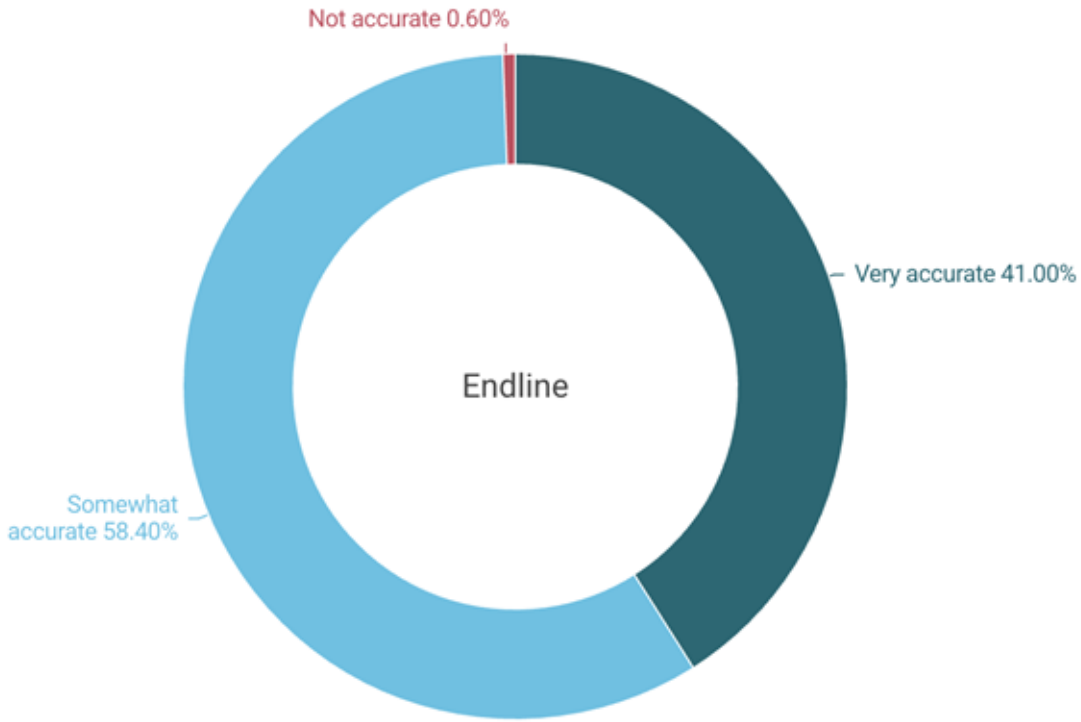


% of total respondents aware of the source **[111 respondents]**

Access to WCI
Perception of accuracy

Among those with WCI access in project areas, **99%** perceived the forecasts to be accurate vs 96% in control areas

Perception of WCI accuracy in project areas



% of total respondents with WCI access **[161 respondents]**

Access to WCI: Factors affecting access to WCI (1/3)

Factors positively associated with WCI access

- Awareness of DARAJA
- The elderly respondents living with disabilities

For probit regression results, see Annex E

Factors affecting access to WCI

Awareness of DARAJA project in Addis Ababa increases the probability of receiving WCI

- The respondents aware of the DARAJA project were 42% more likely to access WCI than those unaware, indicating that project activities—including awareness campaigns—improved access and encouraged proactive information-seeking

Interestingly, elderly respondents living with disabilities were 36% more likely to receive WCI.

- This likely reflects support from caregivers who help them access information.
- This finding suggests that future projects should intentionally target and engage caregivers, as doing so can strengthen WCI access for older people and persons with disabilities, while also enhancing social inclusion.

Access to WCI: Factors affecting access to WCI (2/3)

Factors positively associated with WCI access

- Aged 18–30 and 31–59 years than those aged 60 and above

For probit regression results, see Annex E

The likelihood of receiving WCI was high among respondents aged 18–30 and 31–59 years than those aged 60+

- Respondents aged 18–30 and 31–59 were each 25% more likely to access WCI than those aged 60 and above
- This suggests that younger and middle-aged adults are more engaged with the commonly used dissemination channels than older adults.

Access to WCI: Factors affecting access to WCI (3/3)

Factors negatively associated with WCI access

- Television set ownership
- Being a women and living with disability

For probit regression results, see Annex E

Factors affecting access to WCI

Surprisingly, those owning a functional television set were less likely to receive WCI

- Respondents with access to television were 23% less likely to receive WCI.
- This suggests that national or traditional media channels are either not effectively used for WCI dissemination or that the broadcast timing is inconvenient.
- This aligns with feedback from non-users who identified late delivery as a key barrier to accessing forecasts, indicating a mismatch between TV broadcast schedules and residents' information needs.

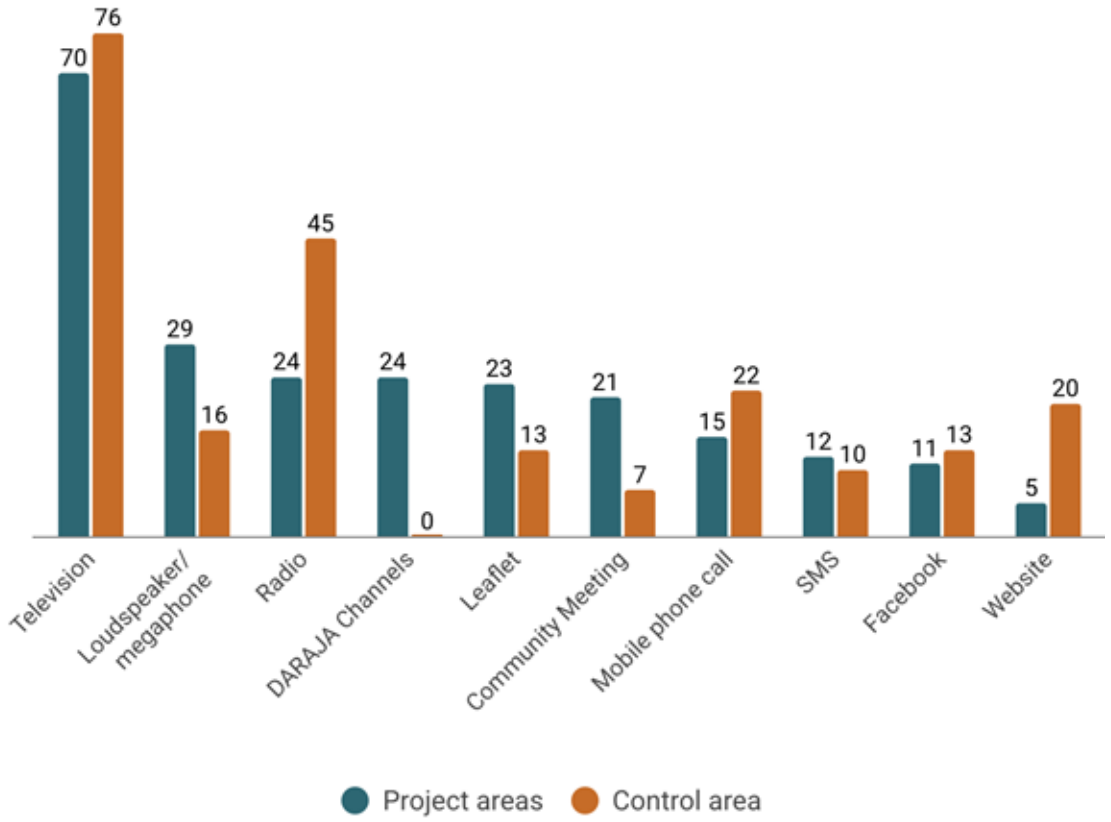
Women living with disabilities were less likely to access WCI

- Women with disabilities are 28% less likely to receive WCI, an intersectional access gap likely driven by channel, accessibility, and timing barriers.
- This points to the need for caregiver-inclusive outreach and accessible formats (audio descriptions, sign language & pictograms, or assistive-tech–friendly content) to close the gap.

Access:
Channels for WCI

Television is the most popular channel to access WCI in both settlements

The most common channels used to receive WCI (%)



% of total respondents who access WCI **[255 respondents]**

Access to WCI

Channels for WCI

Television **70%**

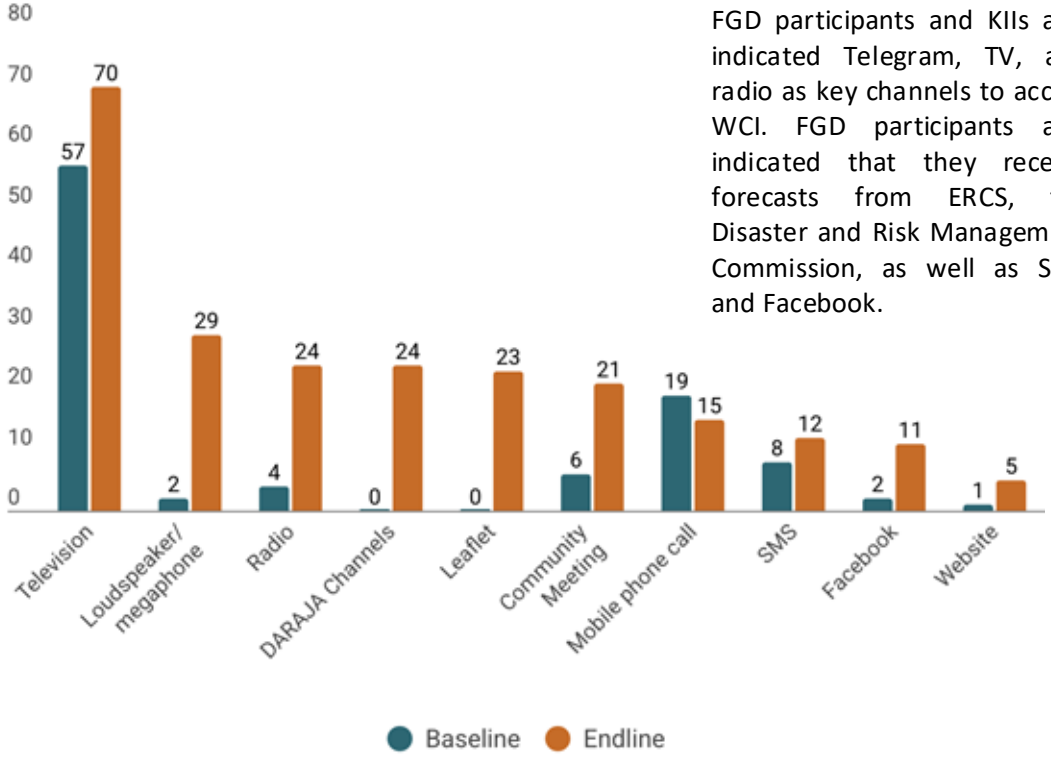
Megaphone **29%**

Radio **24%**

DARAJA channels **24%**

"*We use information received through Telegram, TV & radio.*" – [KII, Women Association, Nefas]

The most common channels used to receive WCI in project areas (%)



FGD participants and KIIs also indicated Telegram, TV, and radio as key channels to access WCI. FGD participants also indicated that they receive forecasts from ERCS, the Disaster and Risk Management Commission, as well as SMS and Facebook.

Other channels include X, Newspaper, poster, community hall, whatsapp and face to face

% of total respondents who access WCI
[161 respondents]

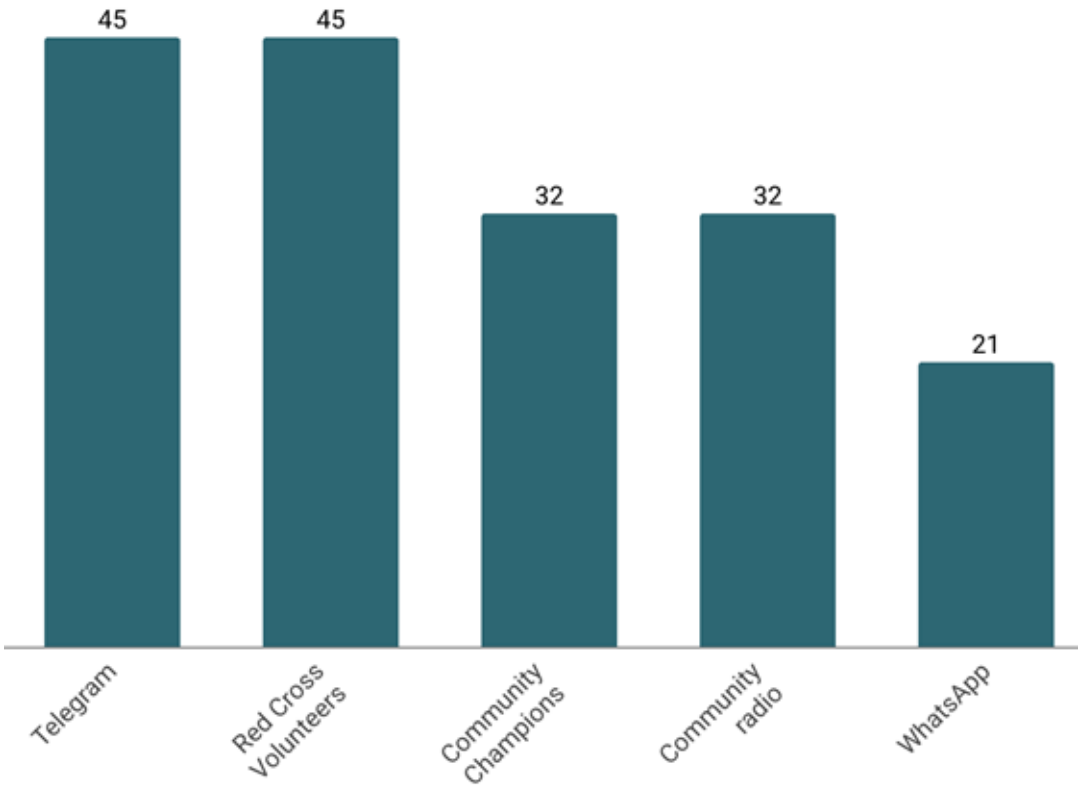
Access to WCI
DARAJA Channels

Telegram **45%**

Red Cross Volunteers **45%**

"Even though we don't have a direct formal mandate, we now have access to an EMI focal person through a Telegram group established by Daraja and the Red Cross. This Telegram group is a very helpful tool for direct communication." – [KII, Traditional Community Insurance Group, Nefas]

DARAJA channels used to receive WCI (%)



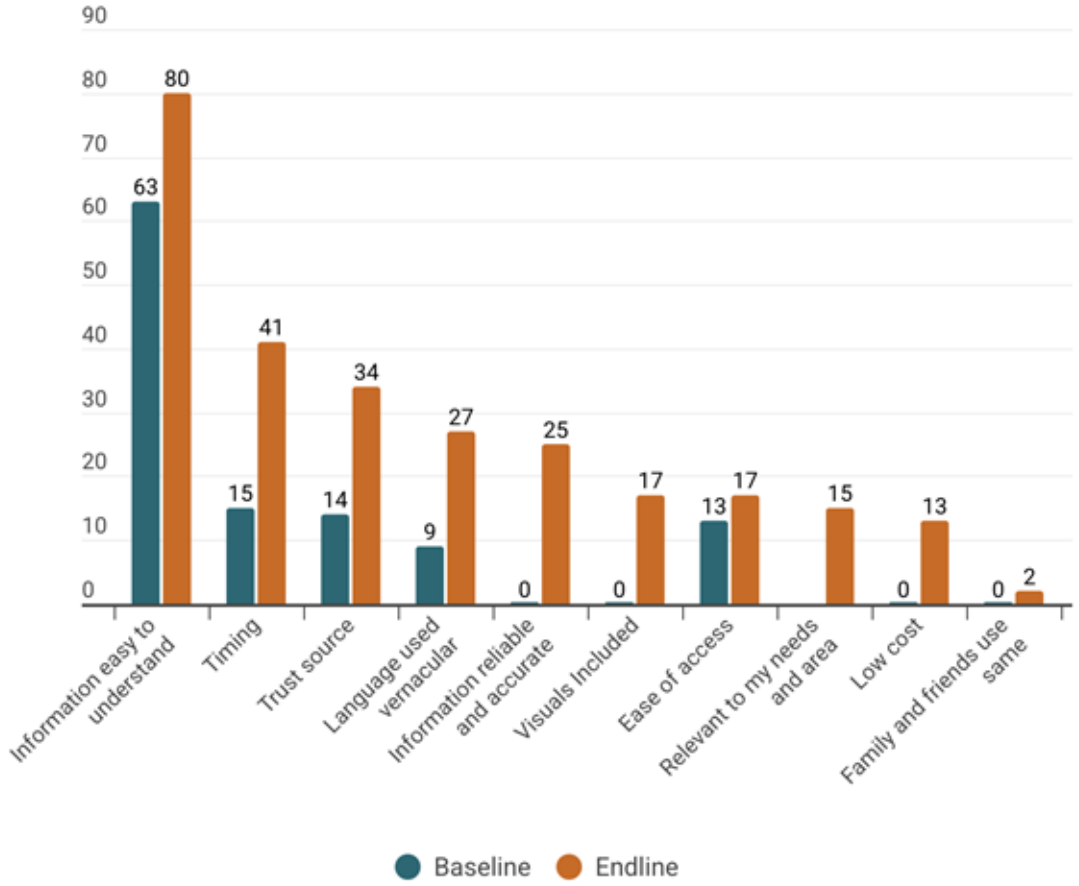
% of total respondents who access WCI through DARAJA channels **[38 respondents]**

Access to WCI
Channels for WCI

The project enhanced ease of understanding, timing of forecast dissemination and trust, as these emerged as key reasons for choosing channels—all of which rose significantly from baseline

FGD participants and KIIs also indicated easy access as a key reason for using the channels. "*We find media channels easy to access, and for information from ERCS and the Fire and Emergency Risk Management Commission, we trust the source.*" – [FGD participants, Mosque Sefer, Akaki]

Reasons for WCI channels used in the project areas (%)



% of total respondents who access WCI **[161 respondents]**

Access to WCI
Potential access

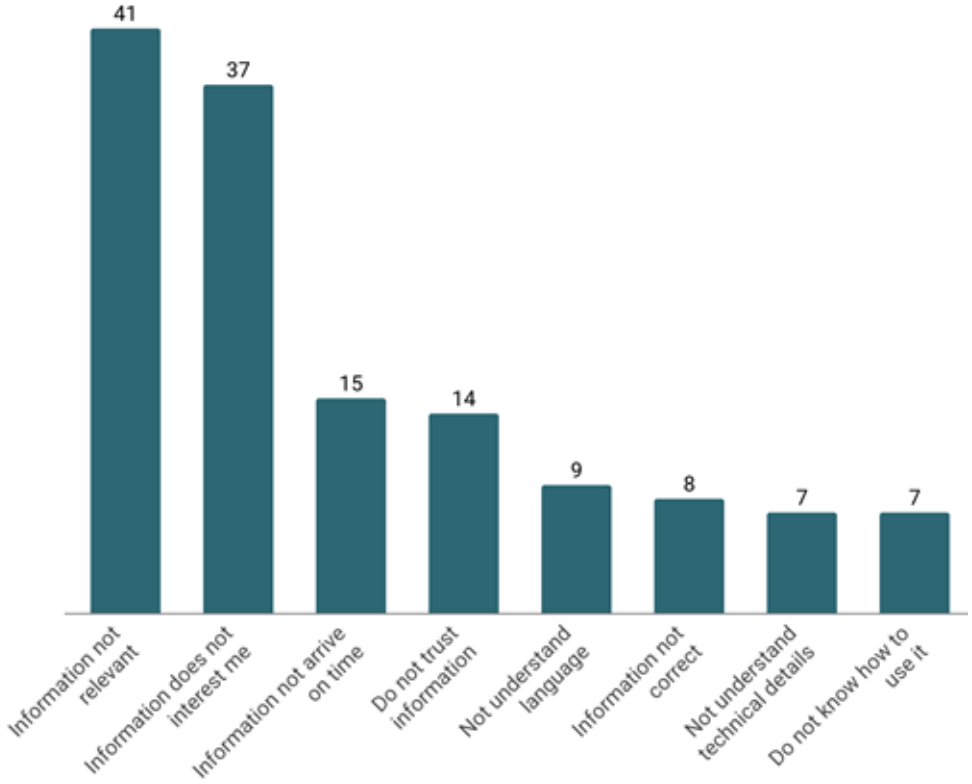
Among those without access, **44%** expressed willingness to receive WCI if it is localised, formats are easily understood, and specific ways to protect themselves and their household from impacts are included.

The main reasons respondents are not currently accessing WCI are that the forecast information is not relevant to them, does not interest them, and is often delivered too late.

They prefer daily and every few days forecasts.

They also prefer the forecasts to include the amount, probability, and duration of rainfall.

Why currently not accessing WCI in project areas (%)



The main early actions respondents would take upon receiving WCI include moving belongings to safe areas, cleaning drains, planning work or business activities, planning travel, making house repairs, and constructing shade within the compound.

% of total respondents without WCI access **[123 respondents]**

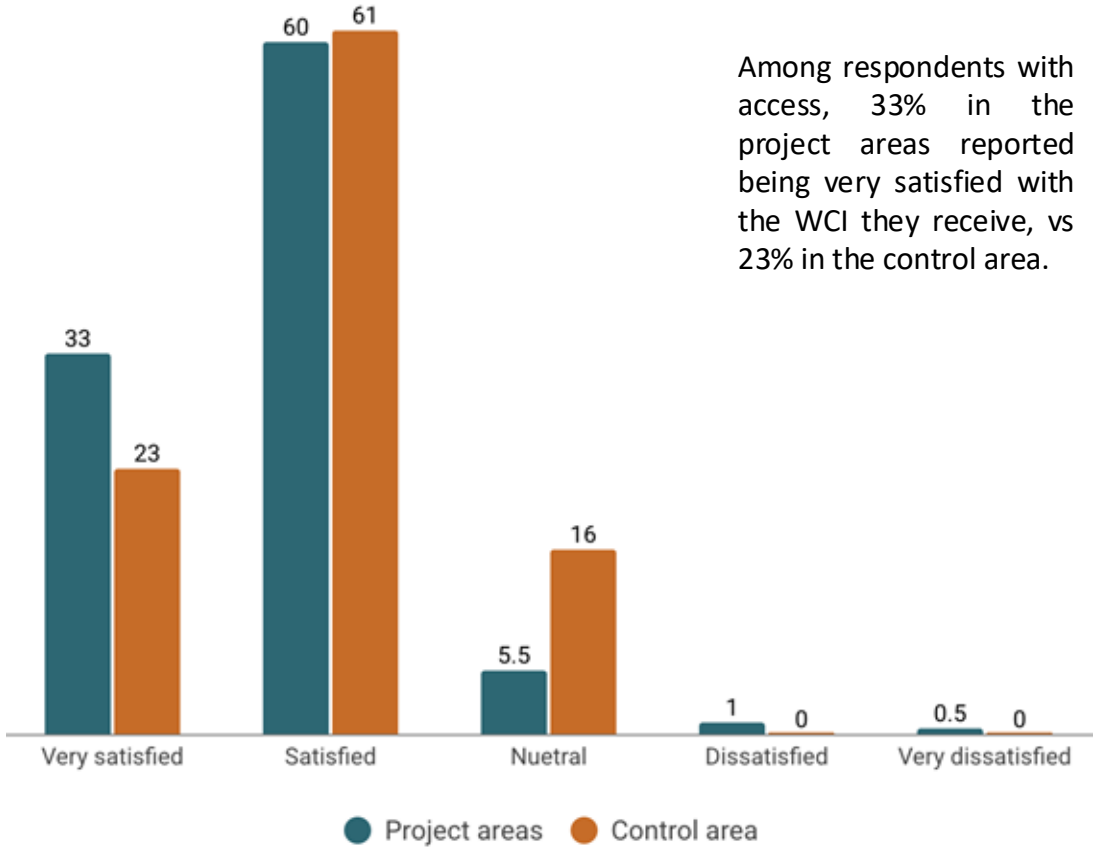
Access to WCI

Feedback and level of satisfaction

Among those with access, **7%** in project areas reported providing feedback to the source through WhatsApp, phone calls, or during workshops – compared with none at baseline. The primary type of feedback shared was appreciation of the forecasts.

FGD participants and KIIs also indicated Telegram as a key channel used to share feedback with EMI. *"The Telegram group is exceptionally useful because it is easily accessible, and I have the ability to ask for clarifications if a warning is not clear."* – [KII, Association of Persons with Disabilities, Akaki]

Level of satisfaction with WCI received (%)



Among respondents with access, 33% in the project areas reported being very satisfied with the WCI they receive, vs 23% in the control area.

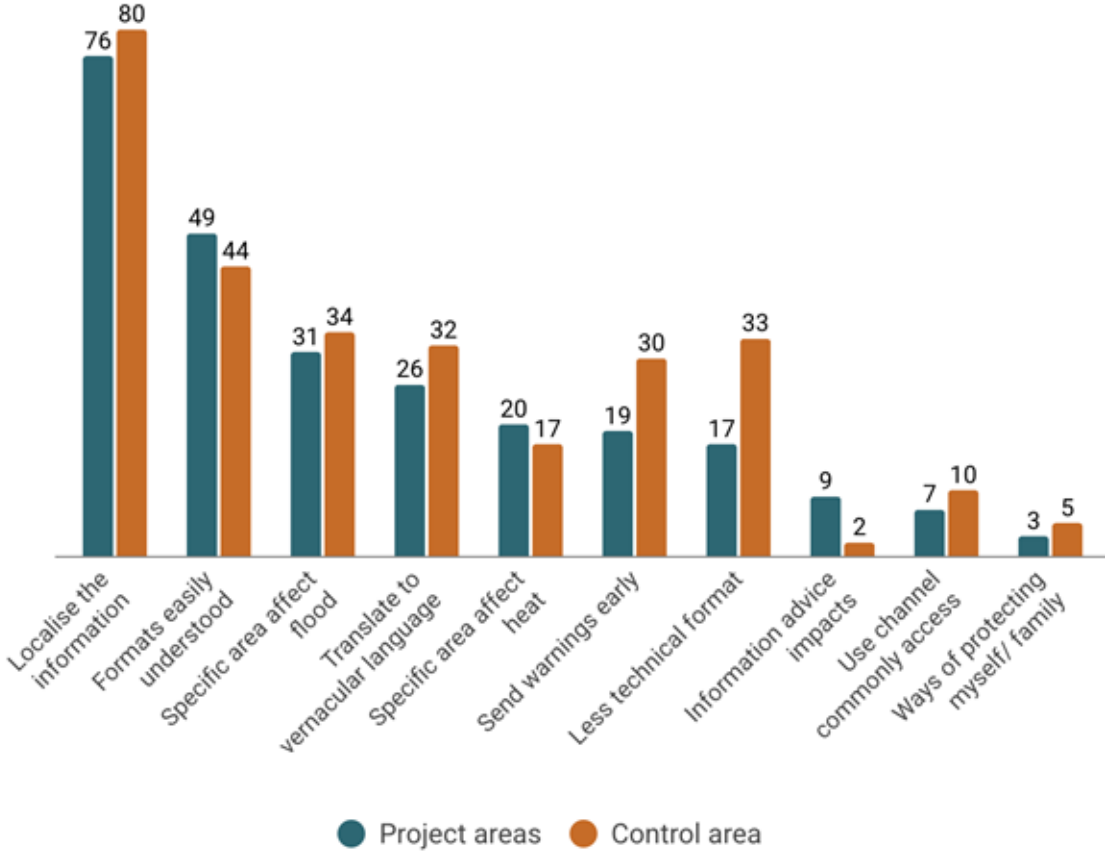
% of total respondents who access WCI **[255 respondents]**

User preferences
Suggested improvements (1/4)

While localisation and clarity (easy-to-understand formats) remained top priorities in both settlements, respondents in the control area additionally highlighted the need for more timely updates, less technical language, translation, and use of commonly accessed channels. This contrast underscores the positive impact of DARAJA in the project areas, where these gaps have been significantly reduced.

"We understand that general city-wide information cannot be 100% certain for every location; as such, we strongly advocate for more location-specific forecasts to improve local preparedness." – [KII, Association of Persons with Disabilities, Akaki]

Suggested improvements (%)



% of total respondents who access WCI **[255 respondents]**

User preferences
Suggested improvements (2/4)

*"The Telegram group is working very well, but it is not yet reachable for the majority of the population. We need to develop mechanisms for those who do not have internet access or smartphones. The project should focus on **making this information accessible through non-digital** means to ensure that the most vulnerable residents are not excluded from the early warning system."* - [KII, Women's Association, Akaki

*"This project represents a very positive step forward, and we strongly support its continuation. Our main hope is that the **granularity and accuracy** of the forecasts continue to improve, as our community's safety depends on it."* – [KII, Traditional Community Insurance Group, Akaki]

Suggested improvements

- "The training provided was excellent, but its reach is currently too limited. We suggest expanding this project to encompass more individuals with disabilities who face direct hazards. We urge organisations, like the Red Cross, to treat PWDs as special cases by providing **customised training and location-specific alerts**. We need to scale up this project so that the most vulnerable members of our community are not left behind." – [KII, Association of Persons with Disabilities, Akaki]

- "Our primary channel is the Head Office, supplemented by TV broadcasts. While this system works, it is currently the only available option. It would be significantly more effective if our branch had a mandated **direct link to EMI,** rather than waiting for information to be passed down through the central hierarchy. This way, we can access information faster and collaborate more effectively on localised disaster mitigation." - [KII, Fire & Disaster Risk Management Commission, Addis Ababa City]

User preferences
Suggested improvements (3/4)

"It would be far more effective if EMI could engage directly at the sub-city level, where they are more accessible to communities. Bringing trainers to the ground to work with actual beneficiaries would help ensure that everyone becomes weather-aware." – [KII, Traditional Community Insurance Group, Nefas]

Suggested improvements

- "This research is valuable, and I recommend that the training be extended directly to vulnerable community members, not just officials. We must also prioritise the **establishment of Local Early Warning Committees** and simplify the information-sharing system to ensure it is easily understood by the community." - [KII, Fire & Disaster Risk Management Commission, Nefas branch]
- "The information is not precise enough to be considered 'the truth' for our specific needs. It lacks **area-based forecasting**. Since the weather can vary every few meters, a general city-wide forecast is insufficient for local disaster management" – [KII, Fire & Disaster Risk Management Commission, Nefas branch]
- "We need to actively promote the EMI Telegram channel to broaden its reach. We also recommend integrating government officials into these information channels, encouraging them to disseminate weather updates through their respective sub-city media outlets. This will help ensure that critical information reaches all levels of the administration as well as the wider public." - [KII, Youth Association, Akaki]

User preferences
Suggested improvements (4/4)

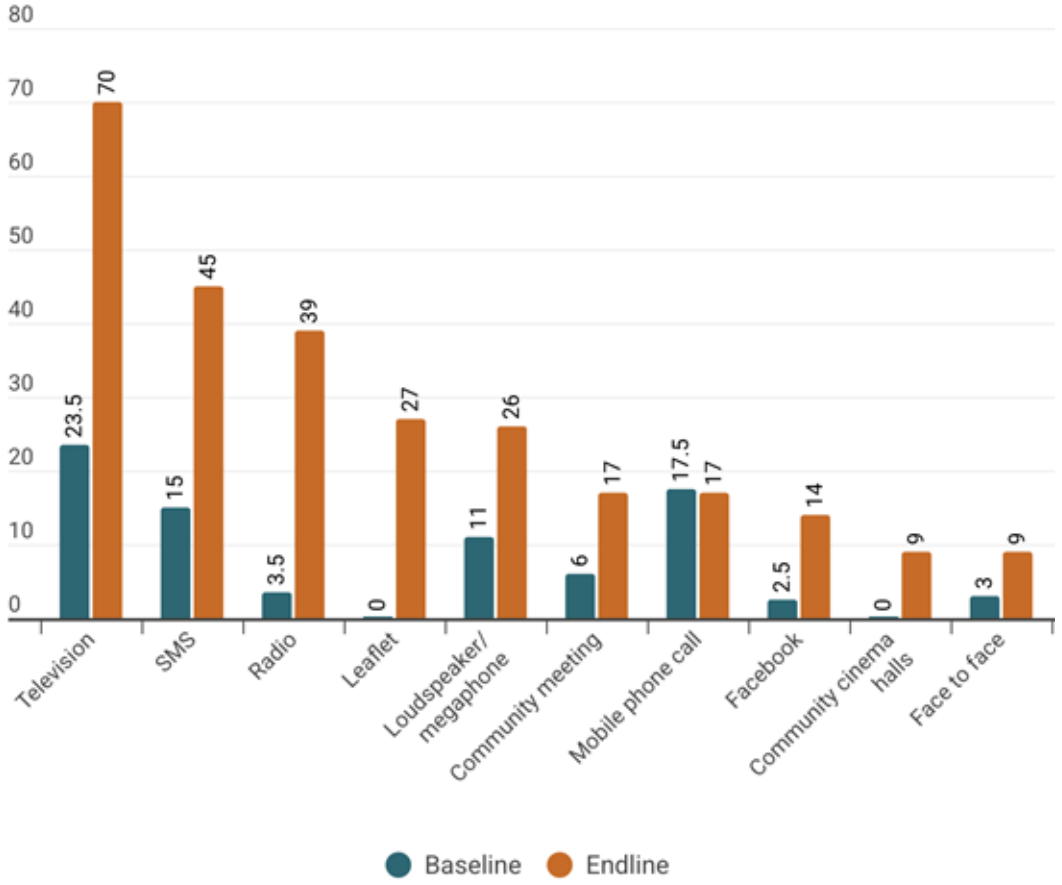
- The FGD participants also expressed strong demand for timely delivery of early warnings and associated advisories on actions to take. "Provide timely and location-specific forecasts and actionable safety instructions." - [FGD participants in Darfur]
- There was also a call for a multichannel early warning delivery system with a strong preference for SMS, radio, and community-based systems, such as local leaders, saving groups, or other community intermediaries. “SMS alerts are best because they don't require internet" – [FGD participants in Somali Tefenakay]
- The FGD participants also point out the need for structural (non-information) improvements, particularly an enhanced drainage system, to improve the effectiveness of early actions. "We need properly built drainage." - [FGD participants in Abu Chefe]

User preferences
Preferred channels

There is a substantial increase in preference for television, leaflets, radio and SMS, indicating a growing demand for visual formats and low-cost, easily accessible channels.

"SMS alerts in Amharic and Afan Oromo are the most effective option because they do not require internet access or proximity to a television" — [FGD participants, Somali Tefenakay, Akaki]

Preferred channels to receive WCI in project areas (%)



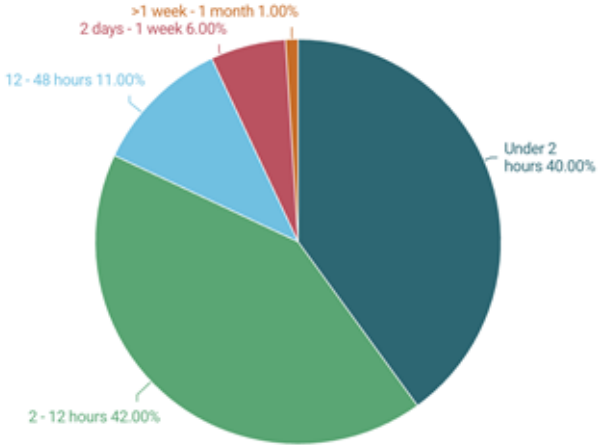
% of total respondents who access WCI **[161 respondents]**

User preferences
Preferred lead time

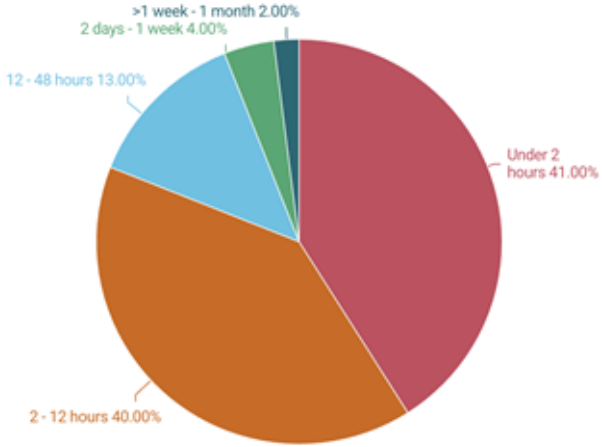
Across all settlements, residents preferred receiving warnings within a lead time of under 12 hours, with the strongest preference clustering in the "under 2 hours" and "2–12 hours" categories.

The same pattern applies to both flood and heat warnings.

Preferred lead time for floods and heat in all settlements (%)



Preferred lead time for flood warnings



Preferred lead time for heat warnings

"Since *Persons with Disabilities (PWDs) require significantly more lead time to secure their belongings and evacuate safely, expanding access to the 3-day forecast through non-digital channels is essential."* – [KII, Association of Persons with Disabilities]

% of total respondents who access WCI **[255 respondents]**

Understanding

Understanding of WCI improved remarkably in the project areas, rising from 81% at baseline to **93%** at endline. This reflects the project's impact in making forecast information clearer and more user-friendly.

In the control area, 93% of respondents also reported understanding the forecasts, although no baseline data is available.

Understanding WCI in project areas

Percentage of respondents who:	Baseline	Endline
If access, **understand the weather information**	81%	91%
If understand: understanding the **WCI very well**	44%	61%
If understand: understanding **only parts of the information**	37%	32%

% of total respondents who access WCI **[161 respondents]**

Understanding: Gender, age and disability

Understanding of WCI by gender, age and disability status (%)

- ➔ **95%** of male respondents reported understanding WCI (vs 43% at baseline), compared to 90% of female respondents (vs 44% at baseline)
- ➔ All respondents aged 60 and above understood WCI, while understanding was 93% among those aged 31–59 (vs 38% at baseline) and 88% among those aged 18–30 (vs 38%)
- ➔ All respondents living with disabilities understood WCI (vs 50% at baseline), compared to 92% of those without difficulties (vs 50% at baseline)

"We suggest establishing monthly coordination meetings to ensure that the needs of PWDs are constantly integrated into weather reporting." – [KII, Association of Persons with Disabilities, Akaki]

"Previously, we did not use this information. However, after attending recent training, our capacity to understand climate data has improved. We are now planning to cascade this knowledge to our members by teaching them how to interpret weather symbols and warning signs so they can take protective measures." – [KII, Association of Persons with Disabilities, Nefas]

% of total respondents who access WCI **[161 respondents]**

Understanding:
Potential impacts

Understanding of the potential impacts of weather warnings improved in the project areas, rising from 76% at baseline to **93%** at endline.

In the control area, 88% of respondents also reported understanding the potential impacts, although no baseline data is available.

"The information provided is very clear. The use of colour coding and bulleted points makes it easy for anyone paying attention to understand the severity of the situation." – [KII, Traditional Community Insurance Group, Nefas]

Understanding the potential impacts in project areas

Percentage of respondents who:	Baseline	Endline
If access, **understand the potential impacts**	76%	94%
If understand: understanding the potential impacts **very well**	41%	60%
If understand: understanding **only parts**	38%	34%

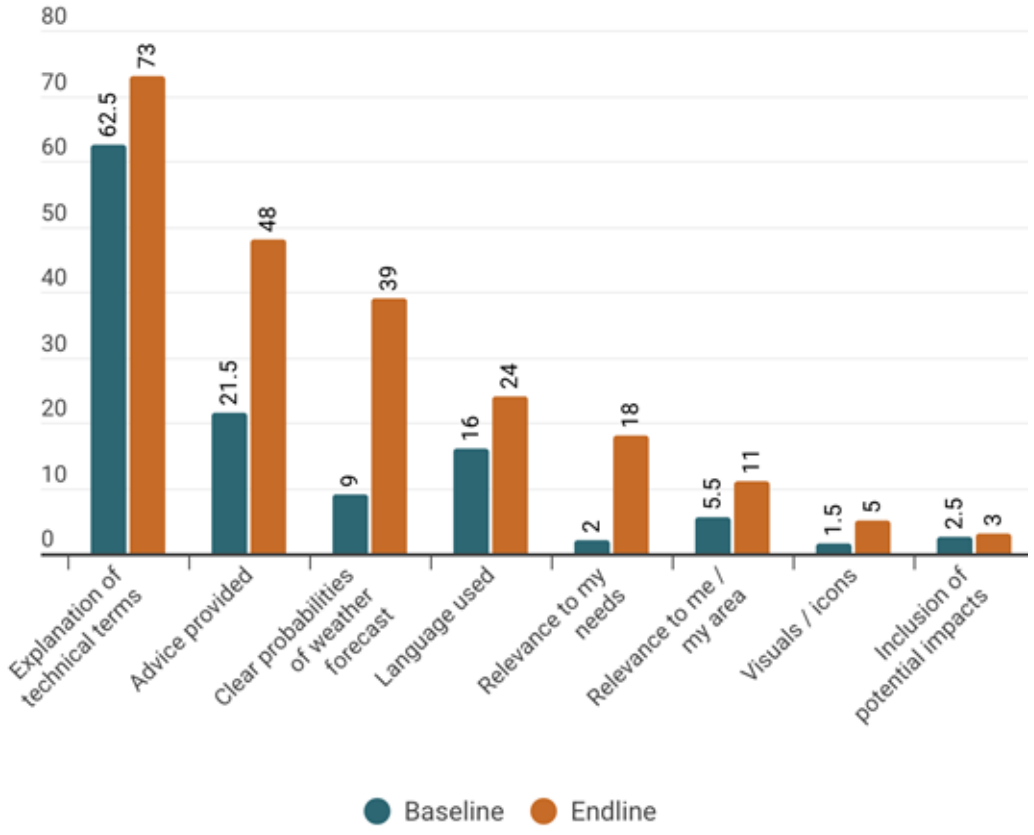
% of total respondents who access WCI **[161 respondents]**

Key enablers to understanding the information

1. Explanation of technical terms (73%)
2. Advice provided (48%)
3. Clear probabilities (likelihood) of the weather forecast (39%)
4. Language used (local dialects: Oromo & Amharic) (24%)

FGD participants and KIIs also identified training through the project as a key enabler for understanding. "*Since attending the training, interpreting weather information has become significantly easier for us.*" – [KII, Women Association, Nefas]

Enablers of WCI understanding in project areas (%)



"*Before the training, the weather information was difficult to interpret, and its practical implications were unclear. However, the training has bridged this gap, enabling me to fully understand the warnings and risks.*" - [KII, Association of Persons wit Disabilities, Nefas]

% of total respondents **[98] among those understand WCI very well**

Level of preparedness

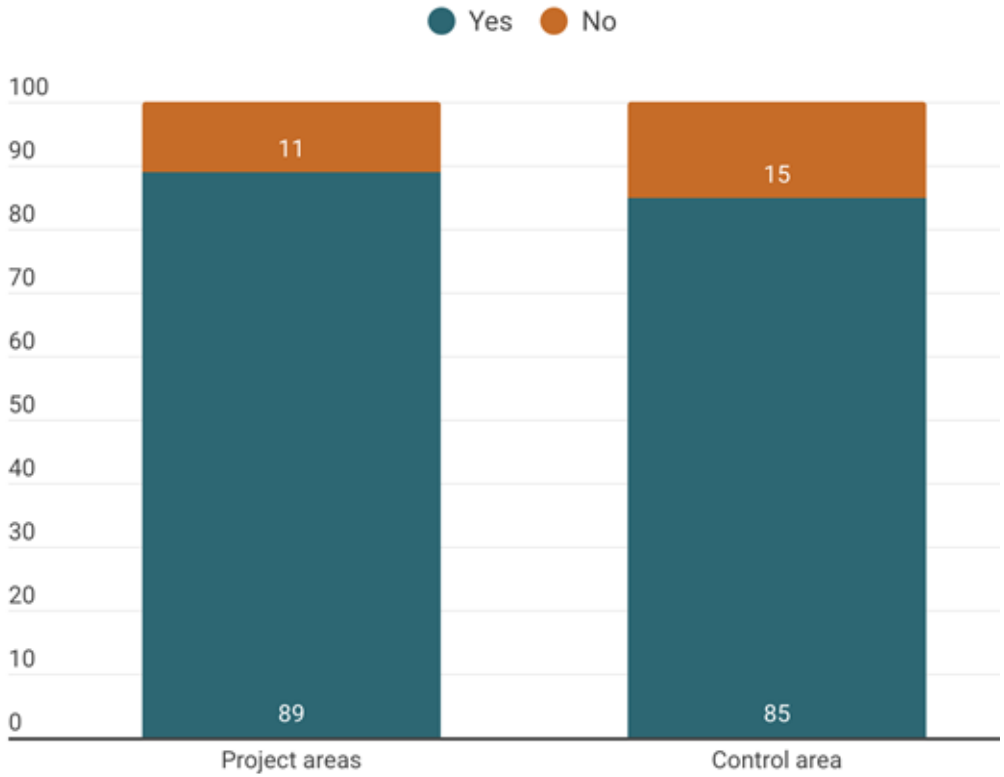
In the project areas, **89%** of respondents with access to WCI reported **feeling prepared** for future disasters, a significant increase from 53% at baseline.

The proportion of respondents with **a plan** in place for future disasters—such as flooding or extreme heat—increased from 33% at baseline to **36%** at endline in the project areas. In the control area, 14% of respondents reported having a disaster preparedness plan.

Among those reached with WCI, 65,808 people reported feeling prepared to deal with future disasters

Addis Ababa Endline Survey Data Results- February 2026

Feel prepared to deal with future disasters (%)



- The **DARAJA's Early Action Plan** helped to **inspire and trigger** community residents to develop their household plans for disasters and strengthen disaster preparedness.

% of respondents affected **[161] with WCI access**

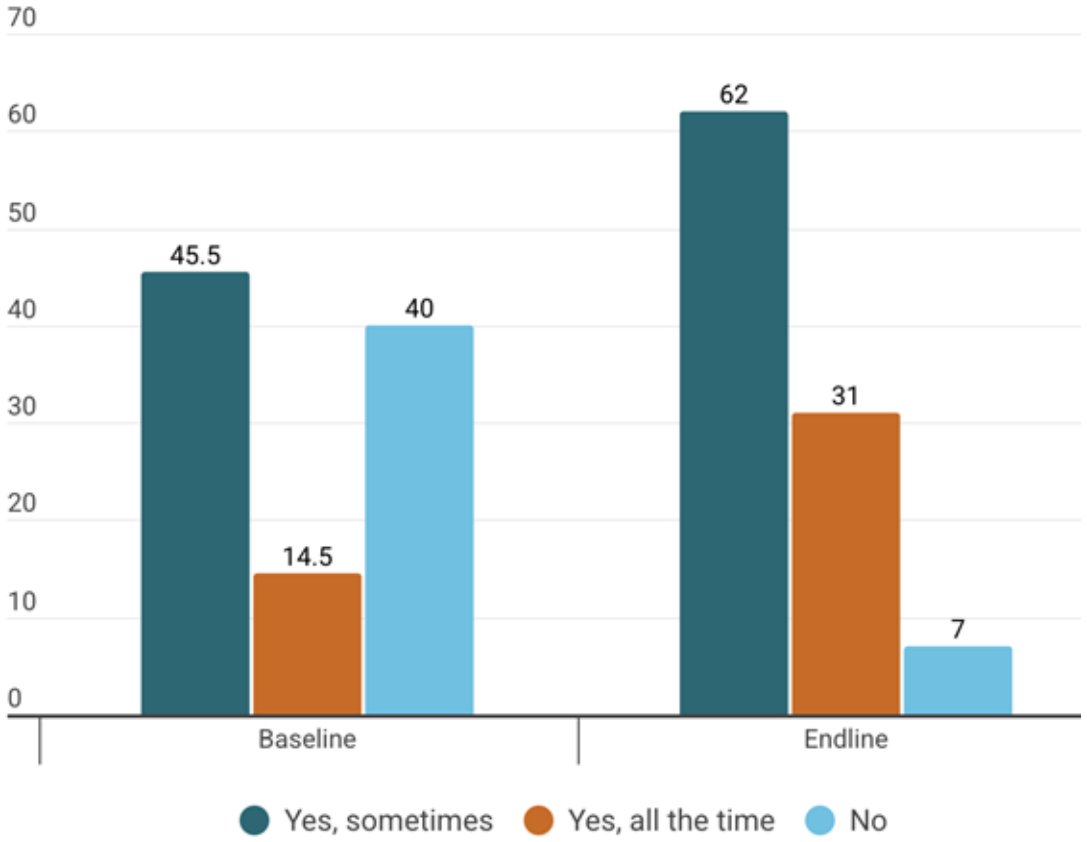
Use

Among respondents with access to WCI in the project areas, **93%** reported using the information to implement early actions—an increase from 60% at baseline.

In the control area, 96% of respondents with WCI access also used it to take early actions, although no baseline data is available.

"We primarily rely on seasonal forecasts because flooding is our main climate-related concern. The forecast information allows us to start awareness campaigns for vulnerable communities and prepare our response teams for the high-risk period." – [KII, Fire and Disaster Response Commission, Addis Ababa City]

Use of WCI to take early actions in project areas (%)



Among those reached with WCI, 68,766 people used the information to take early actions.

% of respondents affected **[161] with WCI access**

Use:
Gender, age and disability

"To protect ourselves, we are taking manual action like stacking sandbags, moving furniture to higher ground, or even temporary relocation." – [FGD participants, Mosque Sefer, Akaki]

"We actively share weather updates through our dedicated Telegram channel, where members provide feedback and discuss local conditions. During the rainy season, this information is critical; we use it to schedule and coordinate drainage cleaning activities. The data allows us to identify and map high-risk areas, enabling us to focus our volunteer cleaning efforts where they are needed most." - [KII, Youth Association, Akaki]

Use of WCI by gender, age and disability status (%)

- Use of WCI to take early action increased for both groups: **97%** of male respondents reported using WCI for early action (up from 52% at baseline), while **88%** of female respondents did so, compared with 49% at baseline.
- By age group, use of WCI for early action increased across all categories. The highest uptake was among respondents aged 31–59 years, with **94%** using WCI compared to 66% at baseline. Usage was also high among younger respondents (18–30 years) and older adults (60+ years), with both groups reporting 88% usage at endline vs 48% & 40% at baseline, respectively.
- Use of WCI increased sharply for both groups: all respondents living with disabilities reported using WCI to take early action (up from 54% at baseline), compared with 92% of respondents without disabilities (up from 42% at baseline)

"The information is very practical. For example, as a person with a disability, I cannot easily hold an umbrella while moving. Knowing the 3-day forecast helps me plan my movements and dress appropriately. More importantly, I can now interpret the symbols provided by EMI, which was not possible for me before the training." – [KII, Association of Persons with Disabilities, Nefas]

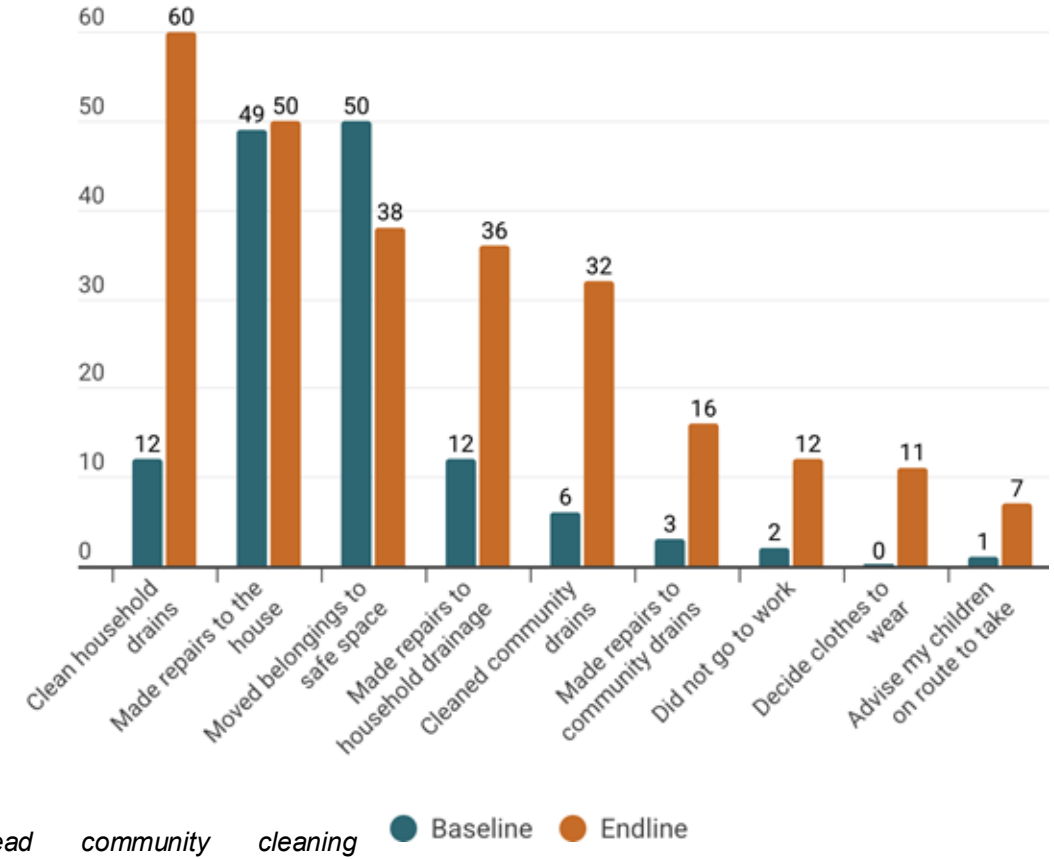
Use
Early actions for floods

Flooding

Big jumps in household and community drain cleaning and repair work point to better preparedness and collective early action rather than last-minute, reactive measures.

1. Clean household drains (60 vs 12% at baseline)
2. Made repairs to house (50 vs 49%)
3. Repair household drains (36 vs 12%)
4. Clean community drains (32 vs 6%)

Early actions implemented for floods in project areas (%)



"*We lead community cleaning campaigns to clear drainage paths ahead of the heavy rains.*" - [KII, Women Association, Nefas]

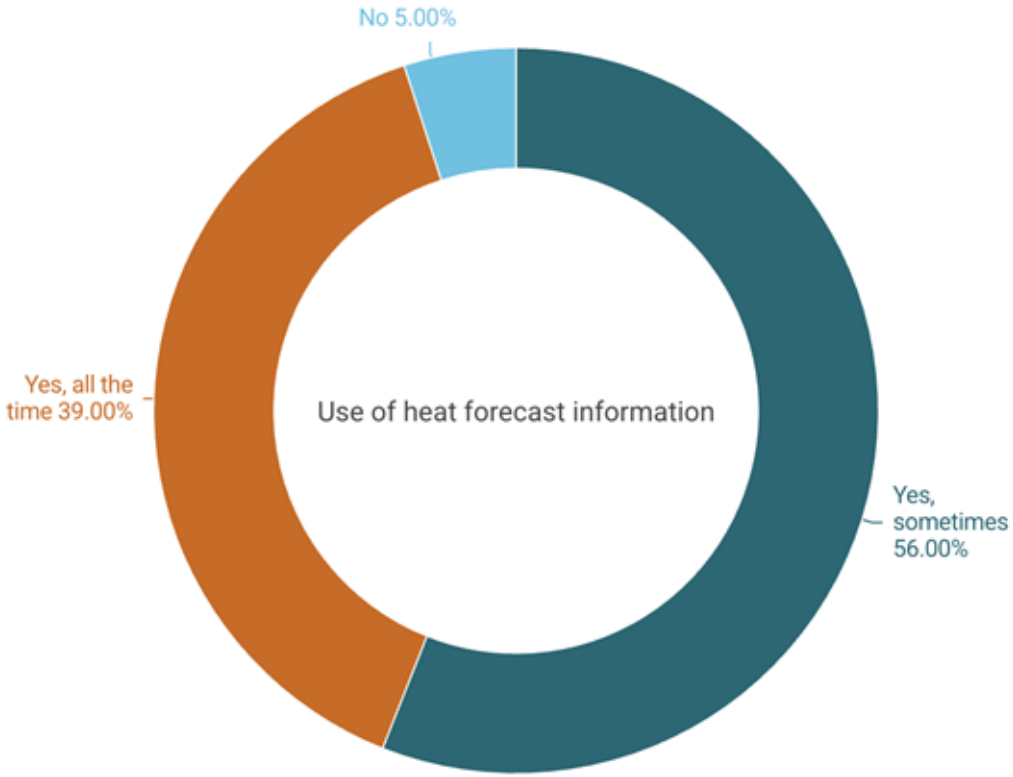
% of total respondents who use WCI **[149 respondents]**

Use
To implement heat early actions

95% of respondents used heat forecast information to implement early actions for heat.

Note: Not captured at baseline

Use of heat forecast information to take early actions (%)



% of total respondents who access heat forecast information **[144 respondents]**

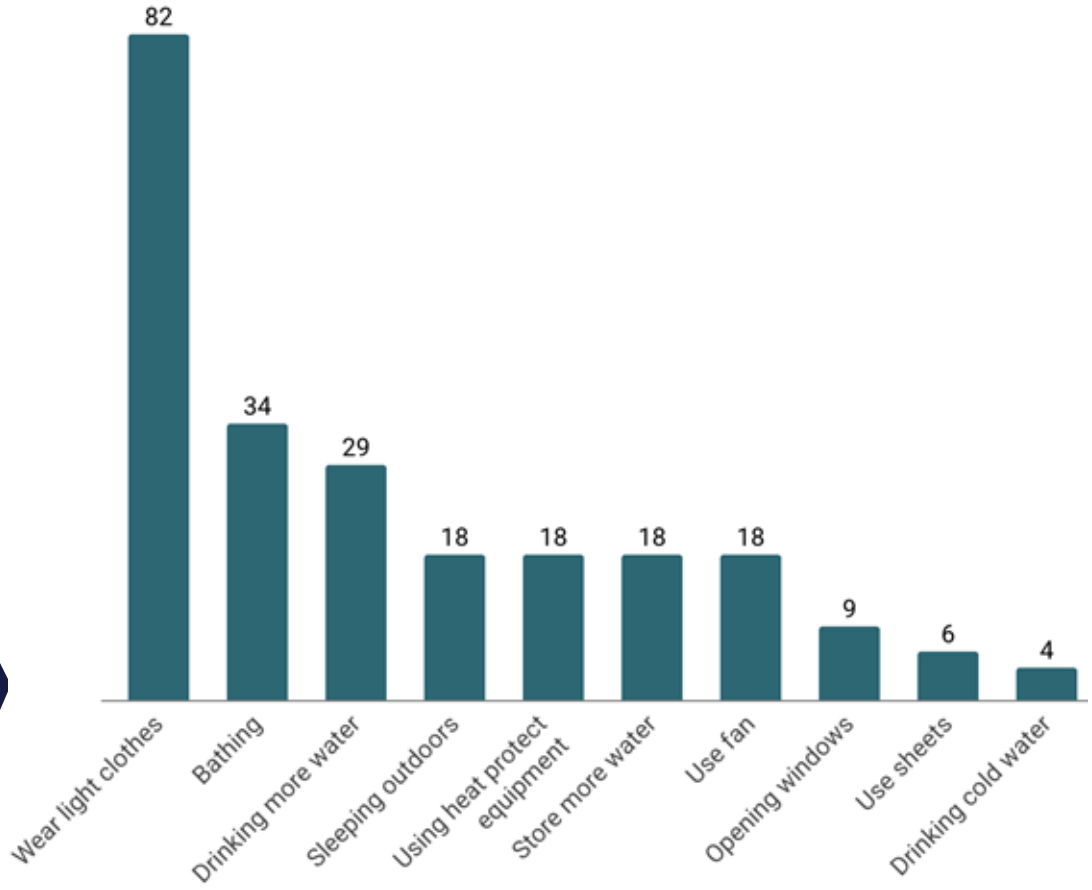
Use
Heat early actions

Most respondents used heat forecasts to wear light clothing, bathe, and drink more water.

FGD participants also echoed these findings as they indicated that they drink more water, reduce physical work, and open doors and windows to improve air flow.

"We open all windows and doors to facilitate proper airflow." - [FGD participants in Abraemu Selase]

Heat early actions implemented (%)

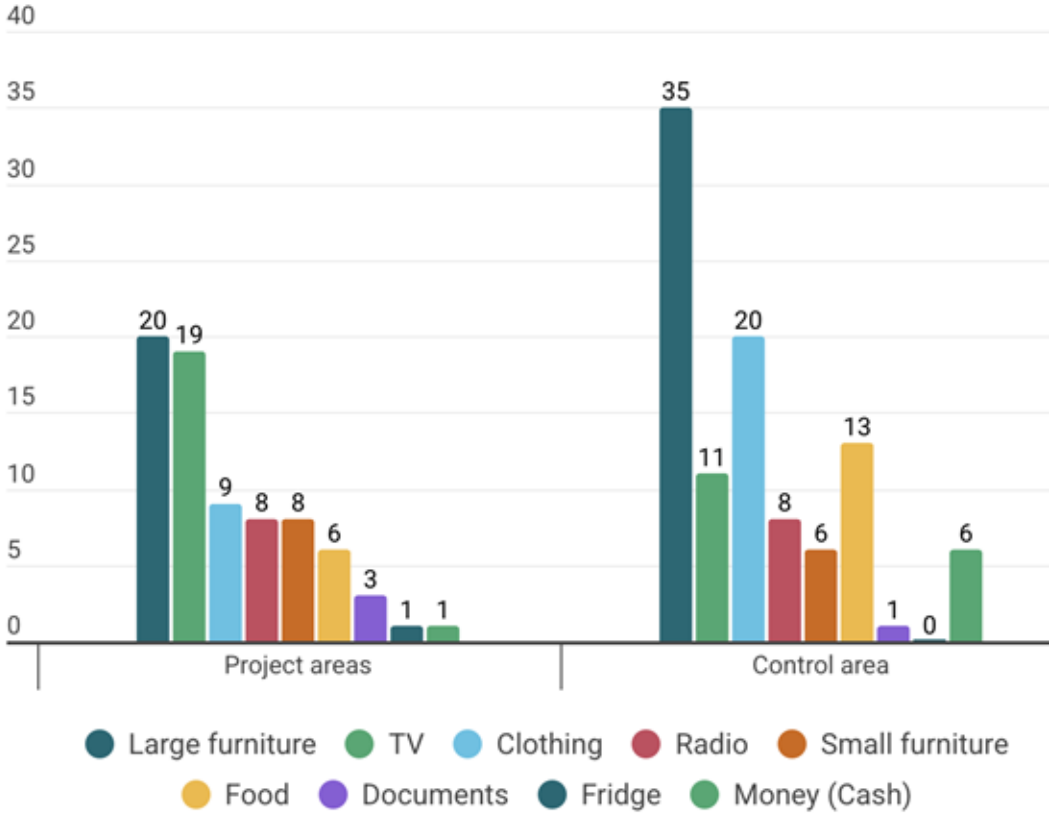


% of total respondents who use heat forecast information **[136 respondents]**

Assets saved by taking early action

Most respondents in the project areas were able to save large furniture and television sets by taking early action, while those in the control area mainly saved large furniture and clothes.

Assets saved by taking early actions based on WCI received (%)



% of total respondents **[149] among those who use WCI**

Remaining gaps
For residents to use WCI

"The final report should highlight the 'Gold Star' success of visual digital channels like Telegram and hazard maps, which have effectively bridged communication gaps for the hearing-impaired community in Akaki Kality. However, a critical "blind community" gap remains, necessitating the introduction of ***audio-based alerts—such as radio bulletins or SMS voice messages****—to ensure total inclusivity for those with visual impairments.* "– [KII, Association of Persons with Disabilities, Akaki]

Among WCI recipients who did not act on the information, the primary reasons were:

Info late
Information did not arrive on time, preventing timely action.

Not relevant
Information wasn't relevant to their area or role.

Unaware
Some were unaware of the actions to take when information arrived.

Couldn't understand
Others were unable to understand the information provided.

% of total respondents who do use WCI **[12]**

Costs and money saved
Flood early actions (1/2)

Among those using WCI, most respondents incurred costs of less than 10, 000 Ethiopian Birr in implementing flood early actions.

The FGD participants identified the following as key costs associated with early actions: labour, materials (such as plastic sheets and sandbags), and house repair expenses.

Costs incurred to implement flood early actions in project areas (%)

How much did taking this action cost you?	Baseline	Endline
Below 10,000 Birr	90.5	87
10,000-30,000 Birr	8.5	11
30,001-50,000 Birr	0.5	2
Above 50,000 Birr	0.5	0

% of total respondents who use WCI **[149]**

Costs and money saved
Flood early actions (2/2)

Among those who took early actions for flooding, 74% reported that these actions helped them save household money

The near one-to-one alignment of the cost and savings distributions, paired with the slight edge in the 10–30k band toward savings, supports a narrative that early actions pay for themselves for most users and do so without imposing high costs.

Implications: Keep promoting low-cost early actions that households can afford

"We saved our household income by reducing repair costs." - [FGD participants in Abraemu Selase]

Money saved by implementing flood early actions in project areas (%)

How much you saved by taking this action?	Baseline	Endline
Below 10,000 Birr	85	86
10,000-30,000 Birr	11	12
30,001-50,000 Birr	3	2
Above 50,000 Birr	1	0

Almost nine in ten households both spent and saved in the ≤10,000 Birr band. This indicates that early actions are generally affordable and deliver measurable—but modest—savings for the majority.

In the 10,000–30,000 Birr band, the share saving (12%) is marginally higher than the share incurring costs (11%), and the 30,001–50,000 Birr shares are identical (2% vs 2%).

% of total respondents who use WCI and saved money **[110]**

Costs and money saved
Heat early actions (1/2)

Most people incurred costs below 10 000 Ethiopian Birr in implementing heat early actions

Note: Not captured at baseline

Costs incurred to implement heat early actions in project areas

How much did taking this action cost you?	Percent
Below 10,000 Birr	87
10,000-30,000 Birr	12
30,001-50,000 Birr	1
Above 50,000 Birr	0

% of total respondents who use heat forecast information **[136]**

Costs and money saved
Heat early actions (2/2)

Among those who took early actions for heat, 71% reported that these actions helped them save household money

Note: Not captured at baseline

Money saved by implementing heat early actions in project areas

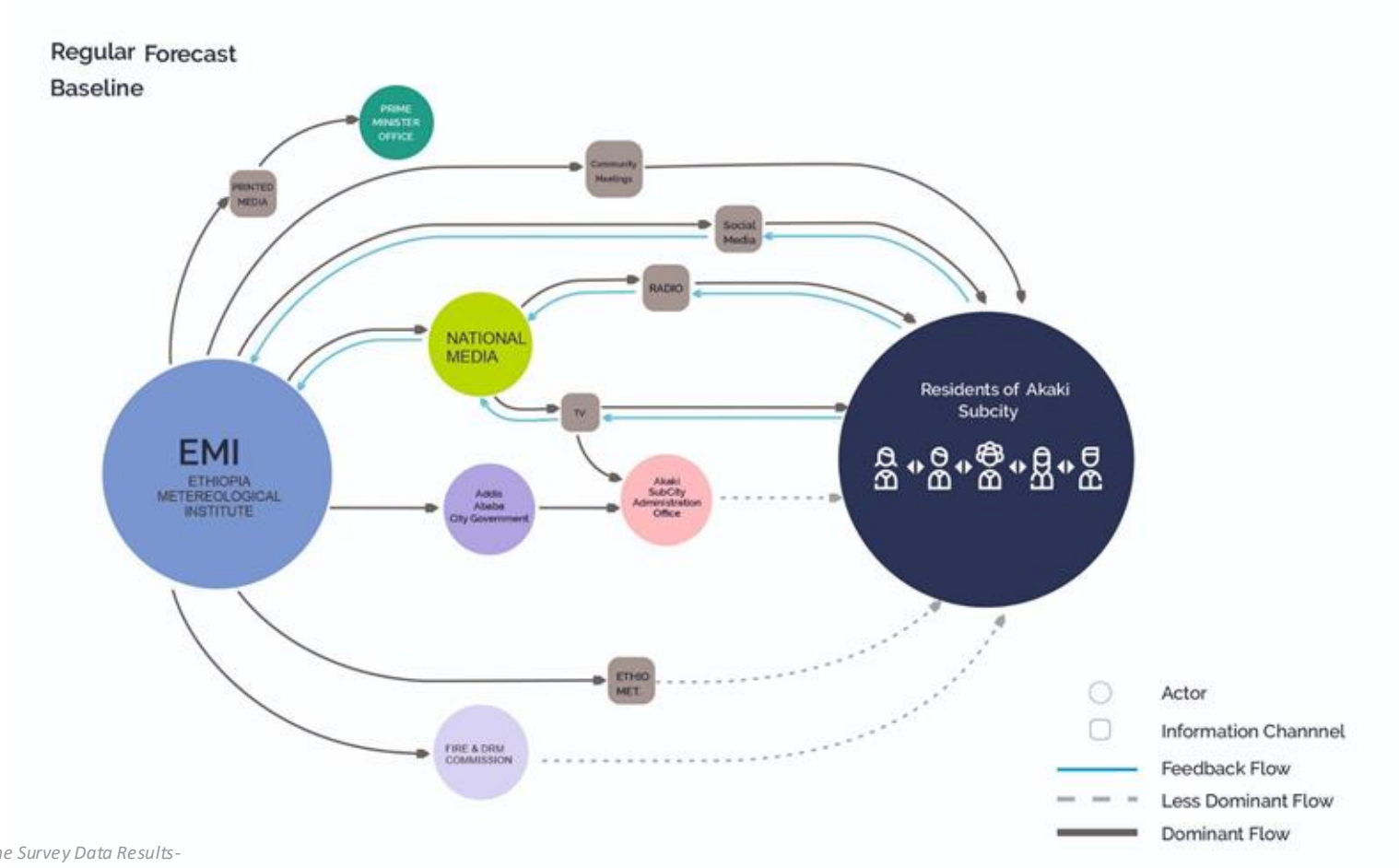
How much you saved by taking this action?	Percent
Below 10,000 Birr	92
10,000-30,000 Birr	10
30,001-50,000 Birr	2
Above 50,000 Birr	0

Nearly all households both spent and saved in the ≤10,000 Birr band, with the share of savings (92%) exceeding the share of costs incurred (87%). This points to affordable measures (e.g., adjusting routines, hydration, wearing light clothes) that generally pay off

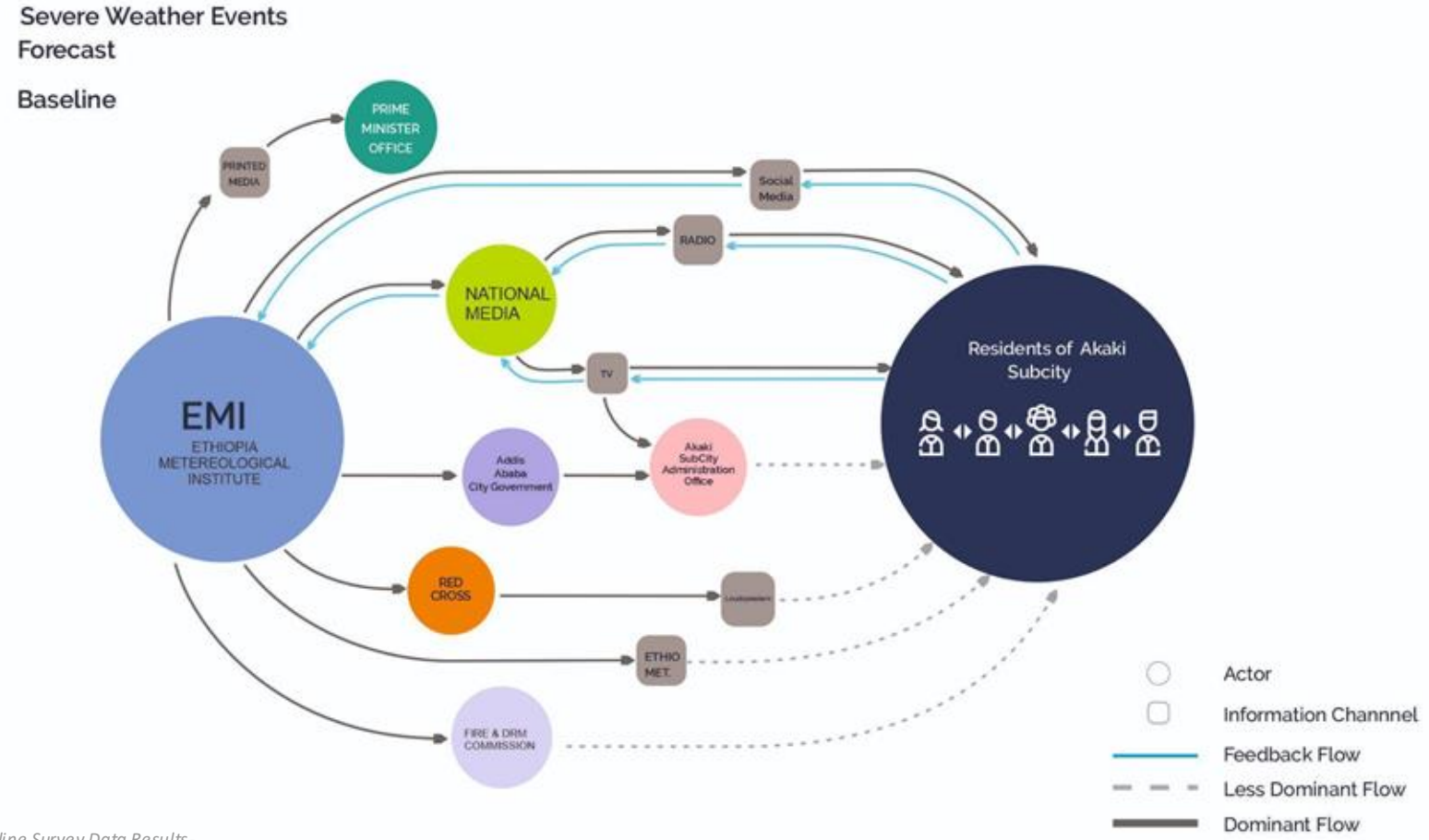
Implications: Keep promoting low/no-cost behaviours (timing outdoor activity, shade, hydration) and community options (cooling/shade points) that deliver benefits without pushing households into higher cost brackets.

% of total respondents who use heat forecast information and saved money **[97]**

Information Ecosystem Mapping



Information Ecosystem Mapping



Summary

- Respondent sample snapshot:
  - Gender: 57% F, 43% M
  - Ability: 88% no difficulty, 12% have difficulties
  - Age: Majority 31-59 years, followed by 18-30 years
  - Most respondents have at least a primary level of education (82%)
  - Monthly household Income: below 10,000 Ethiopian Birr, consistent with the baseline level
- Flooding remains the top climate risk, with perceptions rising from 66% to 74% in project areas
  - There is also an increase in perceiving fire as a risk of concern: jumping significantly from 3% at baseline to 30% at endline
- Flooding resulted mainly in the loss of property & furniture and sickness in the household
  - Nevertheless, severe impacts reduced: Loss of property (↓83%→60%), sinking houses (↓11%→2%) and loss of lives (↓7%→4%) declined, suggesting improved preparedness
- Flood coping strategies include
  - Flooding: more households are reinforcing houses, placing sandbags and digging drainage channels
  - Most respondents (92%) implemented these actions ahead of the rainy season

Summary

- Extreme heat effects:
  - More than half of the respondents perceived heat levels over the past five years as normal (no change)
  - Nevertheless, 25% indicated that their households have been affected by heat during the past 12 months
  - The most notable effects of heat among those affected were fatigue, respiratory illnesses, and increased cases of malaria
  - Young children (5-17 years) appear to be the most vulnerable to heat effects, likely due to school activities
  - Among those affected by heat, 86% incurred costs (below 10,000 Ethiopian Birr) seeking medical treatment
- Effects on work
  - Among those affected, most respondents (71%) indicated that their ability to work was affected by the heat
  - They also experienced income loss of between 10 000 and 20 000 Ethiopian Birr
- Heat coping strategies include
  - Drinking plenty of water, staying indoors/under shade and bathing

Summary

- ➔ Awareness and participation in the DARAJA project: 67% were aware
  - ◆ Most of them first heard about DARAJA from community meetings and local leaders
  - ◆ Among them, 58% participated in DARAJA, mainly in cleanup campaigns and community meetings
- ➔ WCI access: 50% accessed WCI, up from 42% at baseline
  - ◆ Among those with WCI access, 69% knew the source, and 7% provided feedback to it
  - ◆ Having awareness of DARAJA increased the likelihood of accessing WCI by 42%
  - ◆ Elderly respondents living with disabilities were 36% more likely to receive WCI, likely reflects support from caregivers who help them access information
  - ◆ The likelihood of receiving WCI was high among respondents aged 18–30 and 31–59 years than those aged 60+
  - ◆ Surprisingly, those owning a functional television set were less likely to receive WCI. Similarly, women with disabilities were less likely to receive WCI, reflecting an intersectional access gap
  - ◆ Television, megaphone, radio and DARAJA Channels (*telegram & Ethiopian Red Cross Society*) are the most popular ways to access WCI
  - ◆ The ease of understanding, timing and trusting the source emerged as key reasons for choosing channels—all of which rose significantly from baseline

Summary

- ➔ Preferences
  - ◆ Channels: Television, SMS, radio and leaflets
  - ◆ Forecast information: location-specific information, clarity (easy-to-understand formats) and indicate areas to be affected by flooding remains top priorities
  - ◆ Lead time: residents preferred receiving warnings within a lead time of under 12 hours, with the strongest preference clustering in the “under 2 hours” and “2–12 hours” categories, likely because forecasts are more reliable closer to the events
- ➔ Understanding
  - ◆ Among those with access, understanding of WCI rose from 81% at baseline to 91% at endline in project areas. In control areas, 93% of respondents also reported understanding the forecasts.
  - ◆ Understanding potential impacts also rose from 76% at baseline to 94% at endline. In control areas, 88% of respondents also reported understanding the potential impacts.
- ➔ Enablers of better understanding:
  - ◆ Explanation of technical terms (improved clarity)
  - ◆ Advice provided (actionable advice)
  - ◆ Clear probabilities (likelihood) of the weather forecast

Summary

- ➔ Feel prepared and having a plan
  - ◆ Among those with WCI access in project areas, 89% felt the information helped them protect their livelihoods or assets ahead of weather events vs 53% at baseline
  - ◆ 36% of respondents also reported having a household plan for future floods or extreme heat, known to all members (up from 33% at baseline).
- ➔ Use of WCI for early flood actions
  - ◆ WCI use for flood early actions increased to 93%, up from 60% at baseline
  - ◆ In the control area, 96% of respondents with WCI access also used it to take early actions, although no baseline data is available.
  - ◆ Most common early actions for floods were cleaning household drains (60% vs 12% at baseline), making repairs to the house (50% vs 49%) and moving belongings to safe areas (38% vs. 50%)
  - ◆ Assets saved by taking early action: large furniture, televisions and clothes
- ➔ Use of WCI for heat early actions
  - ◆ 95% of respondents used heat forecasts to implement early actions
  - ◆ Most common heat-related actions: wearing light clothes, bathing and drinking more water

Summary

- ➔ Remaining gaps for residents to implement early actions
  - ◆ For those who did not act on the information, the primary reasons were that it arrived too late, it was not relevant to their areas, they were not aware of the early actions to take, or they could not fully understand the information.
- ➔ Costs of flood early actions and savings
  - ◆ Most respondents (87%) spent less than 10, 000 Ethiopian Birr on flood early actions, and 74% reported that these actions helped them save money, mostly below 10, 000 Ethiopian Birr.
  - ◆ Almost nine in ten households both spent and saved ≤10,000 Ethiopian Birr. This indicates that early actions are generally affordable and deliver modest savings for the majority.
- ➔ Costs of heat early actions and savings
  - ◆ Most respondents (87%) incurred costs below 10 000 Ethiopian Birr on early heat actions, and 71% said these actions helped them save money, with 92% saved 10 000 Ethiopian Birr.
  - ◆ Nearly all households both spent and saved ≤10,000 Ethiopian Birr, with the share of savings (92%) exceeding the share of costs incurred (87%).
- ➔ Implications: Keep promoting low-cost early actions that households can afford

Annexes

Annex A - Questionnaire design and deployment

The survey questionnaires (household survey tool, focus group discussion guide and key informant guide) were co-designed with local implementing partners (Ethiopian Red Cross Society and EMI) to ensure that all the questions are customised to the local context. The household questionnaire included variables designed to collect household information, climate hazards faced, access, understanding and use of weather and climate information services as well as their preferences. Inputs from WISER on key variables to conduct socio-economic benefit analysis were also incorporated in the household survey tool. Furthermore, inputs from Atlantic Council to comprehensively capture the impacts and actions implemented to reduce the effects of heat were also incorporated into the survey tools before data collection.

The questionnaire was deployed using Kobo Collect, a mobile data collection platform that proved essential for efficiently capturing data both in online and offline mode. Kobo Collect's offline capabilities and user-friendly interface made it particularly suitable for use in settlements with poor internet connectivity, ensuring seamless data collection despite internet access challenges as enumerators were able to upload the data once reach areas with strong internet connections.

Annexes

Annex B - Household survey sampling

The sampling of households was randomized to eliminate chances of bias and ensure equal chance of participation in the selection of respondents. Three data collection methods were employed: a household survey to gather quantitative data from 476 households, while the qualitative data were collected through focus group discussions (FGDs) and key informant interviews (KIIs). Face-to-face interviews were employed to collect data from all the sampled households. This allowed in-person interactions, allowing enumerators to build trust and offer opportunities for probing to gather detailed responses. A total of 8 FGDs and 9 KIIs were conducted.

Before data collection, the approval was granted by the City Authority.

Annexes

Annex C - Training of data collectors

The data collection team was comprised of a total of 16 enumerators (7 male and 9 female). These were Ethiopia Red Cross Society, volunteers. In addition, five community facilitators (all male) were engaged to assist with community mobilisation. Before data collection, volunteers were introduced to the DARAJA project and the endline survey objectives. They also received training in data collection techniques for household interviews, FGDs, and KIIs, including the use of Kobo on smartphones. The enumerator training was conducted during a 3-day training workshop to ensure that all the enumerators have full understanding of the survey tools and procedures in data collection including the ethical issues such as informed consent, voluntary participation and confidentiality. A preview of the household data collection tool programmed on Kobo Collect was done to ensure that any prevailing inconsistencies and skip logics in the questionnaire were identified and rectified prior to actual data collection and that all the questions are contextualised to the Addis Ababa context and study areas in particular.

Annexes

Annex D - Sample size

For the household survey, a total of 476 households were interviewed. This sample size was calculated using a statistical power analysis approach in STATA. This approach helped to estimate the minimum required sample size to detect the impact of the DARAJA project on residents' access to WCI and be able to conclude that an observed change in WCI access would not have occurred by chance.

The minimum detectable change was set at a 28% increase in WCI access, based on the average regional impact observed during the WISER 2 programme. The power (the probability of detecting a true effect) was set at 0.8 i.e. 80%. The sample size ratio between the treatment and control groups was set at 2, as we anticipated engaging twice as many participants from the project area compared to the control area. This gave a sample size of 453. To compensate for the potential loss of observations during analysis, an additional 5% of the sample size was added, resulting in a total sample size of 476.

Settlement	Area	Sample size
Project area (Akaki)	Abu Chef	22
	Zeniet	28
	Somali Tefenaqay	28
	Dim Dim Sefer	26
	Gelan Condominium	25
	Mosque Sefer	27
Project area (Nefas)	Abrehamu Selassie	94
	Zone 01 Darfur	71
Control area	Boche Woreda 6	78
	Oromia condominium	77
Total		476

Annex E:
Factors affecting access to WCI

Factors affecting access to WCI

Independent variables	Marginal effects	Robust Standard Errors
Project area (1= Yes, 0 = control area)	-0.04	0.13
Years in Settlement (count)	0.03	0.05
Gender (1=Female, 0 = otherwise)	-0.05	0.13
Female with disability (1 = Yes, 0- otherwise)	**-0.28**	**0.39****
Elderly with disability (1 = Yes, 0 – otherwise)	**0.36**	**0.67*****
Access to Mobile phone (Yes=1, 0 = no)	-0.06	0.13
Television set ownership (1 = Yes, 0= no)	**-0.23**	**0.24****
Radio set ownership (1 = Yes, 0= no)	-0.04	0.13
Ordinary Level education and above (1=yes, 0 =otherwise)	0.08	0.14
Living with disabilities (1=Yes, 0 = No disability)	0.03	0.29
Aged 18-30 years (1-yes, 0- Above 60 years)	**0.25**	**0.34****
31-59 age group (1=Yes, 0- Above 60 years)	**0.25**	**0.31****
Awareness of DARAJA (1=Yes, 0 = no)	**0.42**	**0.14*****
Constant	-0.85	0.45*

Mean dependent variable	0.54	Standard Deviation dependent variable	0.499
Pseudo r-squared	0.15	Number of observations	476
Chi-square	85.274	Prob > chi2	0.000
Akaike crit. (AIC)	585.088	Bayesian crit. (BIC)	643.404

*** p<0.01, ** p<0.05, * p<0.1

Picture credit: A data collector from Ethiopia Red Cross Society facilitating an FGD in Dim Dim settlement during the endline survey, February 2026, Akaki, Addis Ababa, Ethiopia. Photo by Andinet Bekele, Ethiopia Red Cross Society.