

COUNTRY STUDY

LINKING POPULATION, FERTILITY AND FAMILY PLANNING WITH ADAPTATION TO CLIMATE CHANGE: VIEWS FROM ETHIOPIA



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Population Action
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Population Action International uses research and advocacy to improve access to family planning and reproductive health care across the world so women and families can prosper and live in balance with the earth. By ensuring couples are able to determine the size of their families, poverty and the depletion of natural resources are reduced, improving the lives of millions across the world.

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INTRODUCTION

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BACKGROUND

Nothing seems... like in the past. On the contrary, the problems are getting worse. The temperature, shortage of food and rainfall situation is worsening.
(Rural community member, Oromia).

...if a family has limited children, he will have enough land for his kids and hence we can protect the forests... In earlier years, we had a lot of fallow lands, but now, as a result of population growth, we don't have adequate fallow land. Therefore, limiting the number of children will help us to cope with the change in climate.
(Rural community member, Southern Nations, Nationalities and People's Region).

As global climate change is unfolding, its effects are being felt disproportionately in the world's poorest countries and among the groups of people least able to cope. As the world adapts to its evolving climate, more global attention is now being focused on adaptation to the effects of climate change; therefore, it is important to assess how people are coping with the effects of climate change, how they could become more resilient to these effects and how people and communities can adapt to changes in climate.¹

Many of the countries hardest hit by the effects of climate change also face rapid population growth, with their populations on track to double by 2050.² This rapid increase in the population is likely to exacerbate the effects of climate change. However, scant research exists to link these issues together. Within the "Impacts, Adaptation and Vulnerability" literature, no studies relate population and fertility with vulnerability, resilience and adaptation to climate change.^{3,4} Furthermore, the role of women in adaptation and coping strategies has also been underrepresented in existing literature, despite evidence that women, especially socioeconomically disadvantaged women, are disproportionately affected by climate change.⁵

In this context, Population Action International (PAI) and Miz-Hasab Research Center (MHRC), in collaboration with the Joint Global Change Research Institute (JGCRI), have undertaken a study to investigate how people in one country hard hit by the effects of climate change relate their experiences with changes in climate to various factors affecting their ability to adapt. Using qualitative methods, this study explores how communities in Ethiopia react to and cope with climate variation, which groups are considered most vulnerable, what resources communities need to adapt to climate changes, and also the role of fam-

ily planning and reproductive health in increasing resilience to climate change impacts. The study was carried out in 2008-2009 in peri-urban and rural areas of two regions in Ethiopia: the Oromia region and the Southern Nations, Nationalities and People's (SNNP) region. This study in Ethiopia is one of the first to include first-hand linkages of population, fertility and family size to notions of vulnerability and resilience to climate change.

IMPACTS OF CLIMATE CHANGE IN ETHIOPIA

Ethiopia is extremely vulnerable to the impacts of climate change due to social, economic and environmental factors. In particular, high levels of poverty, rapid population growth, a high level of reliance on rain-fed agriculture, high levels of environmental degradation, chronic food insecurity and frequent natural drought cycles increase climate change vulnerability in this country. Climate change will have a notable impact on Ethiopia's temperature and precipitation: average annual temperatures nationwide are expected to rise 3.1° C by 2060, and 5.1° C by 2090. In addition, precipitation is projected to decrease from an annual average of 2.04 mm/day (1961-1990) to 1.97 mm/day (2070-2099), for a cumulative decline in rainfall by 25.5 mm/year.⁶ In part because most agriculture is rain-fed and provides livelihoods for 85 percent of the population, farmers will be heavily affected by these changes.⁷

Drought, already endemic to Ethiopia, has increased in the past several decades, leading to widespread food insecurity and malnutrition. Children five years and under born during a drought are 36 percent more likely to be malnourished and 41 percent more likely to be stunted than those born during a period of normal precipitation.⁸ Ethiopia is already heavily dependent on food aid, and this dependency is only expected to grow with imminent climatic changes. Flooding has increased in frequency, pre-

dominantly due to deforestation and soil degradation: every year, the country loses 1.5 billion tons of topsoil, and 82 percent of the country's land area is experiencing soil erosion.⁹ Only 2.4 percent of Ethiopia remains forested, down from an estimated 16 percent in 1950. Population pressure has led to increased demand for agricultural and grazing land, as well as wood for fuel and construction purposes. Furthermore, over-cultivation and over-grazing increase soil erosion and strip soils of nutrients, decreasing available arable land and accelerating deforestation rates. Pastoralists are affected by loss of grazing lands and are more prone to famine in drought situations.

POPULATION, FERTILITY AND FAMILY PLANNING IN ETHIOPIA

Ethiopia's 2007 census measured the population as 74 million, growing at a rate of 2.6 percent annually.¹⁰ The country's population is expected to more than double by 2050, even with the ambitious assumption that fertility rates decline to nearly replacement level.¹¹ Population density is also projected to more than double from 72 people per square kilometer in 2005 to 166 per square kilometer in 2050. Ethiopia has a very young age structure, with 72 percent of the population under age 30.¹² Currently, the country is predominantly rural (85 percent), although with urban areas growing at a rate of 4 percent annually. almost half of the population is projected to be urban-dwelling (42 percent) by 2050.¹³

In 2005, a national survey showed that women typically have 5.4 children in their lifetimes, a small decline from 5.5 children per woman in 2000 and a larger decline from 6.4 children per woman in 1990.¹⁴ These national estimates mask huge regional and socioeconomic variations. Women in rural areas have higher fertility than their urban counterparts (6.0 vs. 2.4), and women with no education have a much higher total fertility rate than women with secondary education or



Residents in urban SNNPR lined up to fetch free water from 'bono' – public water tap. Sidama Zone, Loko Abaya Wereda.

higher (6.1 vs. 2.0). Fertility generally begins early and peaks among women aged 25-29 years; by the age of 18, 28 percent of women have given birth. Finally, fertility is strongly associated with wealth: women in the lowest income quintile have, on average, 6.6 children, while women in the highest quintile have an average of 3.2 children.

While awareness of family planning is high, only 15 percent of married women are currently using modern methods of contraception. Use of family planning is higher in urban areas, among women with higher levels of education, and among women in higher wealth quintiles. Most importantly, an estimated 34 percent of currently married women have an unmet need for family planning; that is, they want to postpone childbearing for two or more years or stop entirely, but they are not currently using contraception.

POLICIES ADDRESSING POPULATION, ENVIRONMENT AND CLIMATE CHANGE

In addition to population, poverty and reproductive health, Ethiopia has several policies addressing the environment and climate change. In general, these policies only include a cursory discussion of population issues (e.g., population pressure and rapid population growth).

Ethiopia's *Environmental Policy*, enacted in 1997, focuses on the sustainable use of renewable and non-renewable resources, the maintenance of the ecosystem and the rehabilitation of degraded regions. The policy states that individuals have a right to a healthy environment, sustainable resource use and security of land tenure. Additionally, the Environmental Policy identifies rural-to-urban migration, poverty and population

pressures as salient environmental concerns.¹⁵ Ethiopia also has a National Policy on Disaster Prevention, released in 1993, which focuses on ameliorating drought impacts. Interventions included in this policy are provision of relief services and elimination of the underlying causes of vulnerability to disasters. Population is not included as an indicator of vulnerability.¹⁶

Ethiopia also has a Climate Change *National Adaptation Programme of Action* (NAPA), which was created in 2007 to address the effects of climate change. The NAPA identifies droughts as the most threatening climate-related hazard facing Ethiopia and recognizes dependence on rain-fed agriculture, poor water resource development, and importantly, a high population growth rate as key underlying causes of Ethiopia's vulnerability to climate change. The NAPA additionally proposes a prioritized list of adaptation projects, which include enhancing agricultural productivity, irrigation, early warning systems for droughts and floods, water resource development, and research and development. However, addressing population growth is not included within these projects.¹⁷

The *National Population Policy* of Ethiopia was adopted in 1993 with a primary goal of achieving harmony between the country's rate of population growth and its capacity to utilize its natural resources to best serve this growing population.¹⁸ The policy is based on the country's level of underdevelopment and inability to alleviate poverty due to population pressure, low economic development and low technological capacity. The policy's general objectives include reducing population growth, promoting social and economic development, reducing rural-to-urban migration, reducing the degradation of natural resources and improving the social and economic status of women and vulnerable groups. The policy acknowledges three specific goals, which demonstrate the necessity of integrating population,

health and environment at the policy level: reduce the country's fertility rate, increase the prevalence of contraceptive use and improve agricultural productivity.¹⁹

Ethiopia also has a *Reproductive Health Strategy*, formulated in 2006, which also lists a goal of increasing contraceptive prevalence to 60 percent by 2010. Other goals enumerated in this strategy include reducing unwanted pregnancies and enabling individuals to achieve their desired family sizes by improving access to family planning services. The Reproductive Health Strategy makes no mention of the National Population Policy or of demographic issues.²⁰

Ethiopia's Poverty Reduction Strategy Paper, "A Plan for Accelerated and Sustained Development to End Poverty (PASDEP)," also has a section addressing the country's population issues, but falls short of a comprehensive strategy. Specifically, the PASDEP seeks to increase the country's contraceptive prevalence from 15 percent to 60 percent by 2009/10, to increase family planning service availability and to improve female education throughout Ethiopia.²¹

MEASURING VULNERABILITY AND RESILIENCE

This research builds on resilience and vulnerability literature,²² particularly the quantitative Vulnerability-Resilience Indicators Model (VRIM), developed at JGCRI,²³ using a qualitative, case study approach to capture the voices of people experiencing the effects of climate change.

The VRIM provides a framework to measure and rank country vulnerability and resilience, examining both how social and ecological systems could be negatively affected by climate change (sensitivity) and the capability of a society to maintain, minimize loss of, or maximize gains in welfare (adaptive capacity). Sensitivity is determined by the susceptibility of settlements, infrastructure, food security, ecosystems, human health and water resources to climate change impacts, while adaptive capacity is determined by civic and human resources, economic capacity and environmental capacity.

In selecting a country for the case study, the researchers considered the following criteria: documented changes in climate, a rapid population growth rate and a ranking as one of the world's least developed countries. Ethiopia was chosen for

this study in part because it meets these criteria and falls in the lowest quartile of the VRIM index, and also in part because other global measures indicate that Ethiopia's citizens could be vulnerable to the effects of climate change. These measures include the United Nations Development Programme's (UNDP) Human Development Index, which ranks Ethiopia 169 out of 177 countries, and the UNDP's measure of gender inequality, which ranks Ethiopia 72 out of 93 countries on the degree to which women take part in the country's economic and political arenas.²⁴

RESEARCH DESIGN

The study uses a qualitative cross-sectional approach with a variety of data sources. To begin, the study included a review of data on Ethiopia's current and projected climate change impacts, such as changes in temperature, rainfall and crop failures. Policy documents addressing poverty, population, environment and climate change were also examined to provide a context for the research findings.

Data collection included in-depth interviews (IDIs) with key stakeholders in the climate change arena—national-level and local policymakers and government representatives, community lead-

ers, and civil society groups—as well as IDIs and focus group discussions (FGDs) with men and women living in communities directly threatened by climate change effects. In all, the study included 12 focus group discussions conducted separately with 48 men and 48 women, 24 in-depth interviews with community members and leaders and 14 in-depth interviews with policymakers, government representatives and other key leaders (Table 1). The study was conducted in peri-urban and rural pastoralist and agricultural areas. Potential study participants (FGDs and IDIs) were identified in each location based on residence, knowledge about community life and past experience of climatic changes. Willing participants took part in the study. A background questionnaire was used to collect socioeconomic and demographic data from FGD participants and community members who participated in the IDIs. Each interview guide was first translated from English into Amharic, pre-tested, adapted and then finalized.

The FGD and interview guides asked open-ended questions, with some probes (see Attachment 1 for a summary of the questions and the probes). PAI, JGCRI and Miz-Hasab developed the questionnaire, and Miz-Hasab conducted the fieldwork. The FGDs and IDIs were transcribed verbatim and translated into English. The transcripts were analyzed jointly by Miz-Hasab (in Amharic and English) and PAI (in English). Quotes were selected to reflect the range of participants, including women and men from peri-urban and rural Oromia and SNNP, community leaders, policymakers, government representatives and key leaders. Miz-Hasab and PAI collaborated on the final report.

SITE SELECTION AND FIELDWORK

Miz-Hasab carried out the fieldwork in two sites in Ethiopia: the Oromia region (East Shewa Zone and Fentale Woreda), and the Southern Nations,

Nationalities and People's (SNNP) region (Sidama Zone, Loko Abaya Woreda). The research sites were selected in consultation with the Oromia and SNNP regional administrations. In Oromia, the selection criteria included that the area experienced recurrent adverse climatic conditions and that the rural livelihood was predominantly pastoral. In SNNP, the selection was similar in terms of climatic conditions, except that the population was predominantly agricultural. The livelihood criterion ensured representation of Ethiopia's two major rural livelihoods and provided researchers with the ability to assess qualitative differences in experiences with and adaptation to changes in climate. In both Oromia and SNNP, the peri-urban sites were selected to be towns associated with the rural sites (e.g. local government or market towns). The Oromia region makes up a large part of central Ethiopia, while SNNP is located in the southwestern part of the country (Maps 1 and 2). Fieldwork was carried out from December 2008 to May 2009.

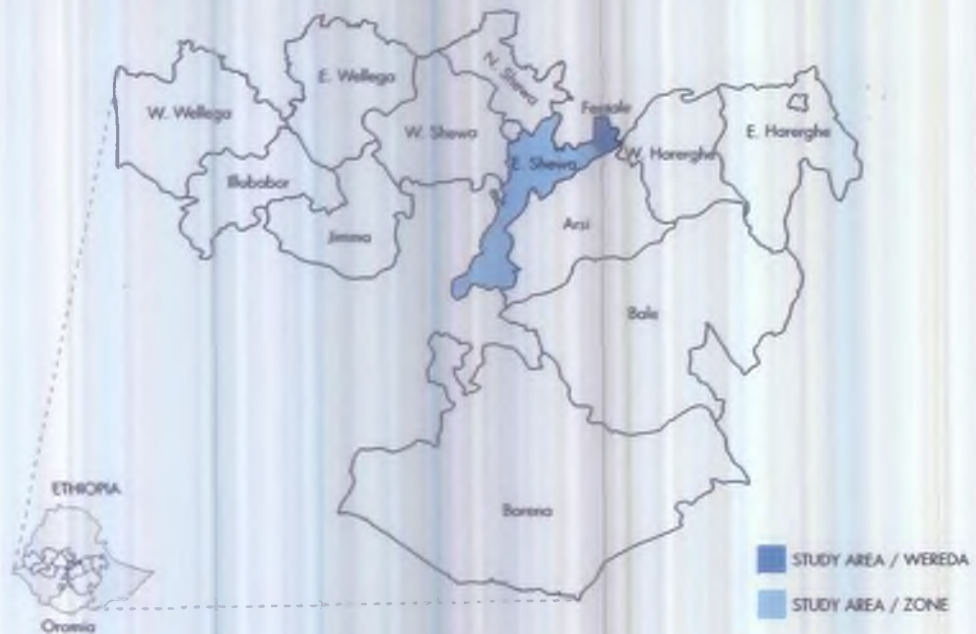
OROMIA

The East Shewa Zone is located in the middle of the large and expansive Oromia region in central Ethiopia. The town and the peasant associations where the interviews were conducted are located in Fentale Woreda of Eastern Shewa Zone (Map 1). Fentale Woreda is predominately rural, with a hot and dry climate and very little rainfall. The rural areas of Fentale Woreda are low-land, and most of the residents are pastoral. However, some agricultural practices have also recently been adopted. The area has been affected by both a shortage of regular rain, resulting in recurrent droughts, and also unexpected intermittent heavy rainfall, resulting in repeated over-flooding of the Awash River and the Beseka Lake, the area's two main water sources. Beseka Lake, in particular, is salty and has also been growing larger over time. Lake overflow destroys farmlands and disrupts crop production. This phenomenon has subse-

TABLE 1. NUMBER AND TYPE OF INTERVIEW, BY LOCATION, ETHIOPIA, 2008-2009

REGION, ZONE AND WOREDA	LOCATION	NUMBER OF INTERVIEWS				IDIs - Policymakers, government representatives and other leaders
		FGDs - Community members		IDIs - Community members, leaders		
		MALE	FEMALE	MEMBERS	LEADERS	
Oromia/East- ern Zone/Fentale Woreda	Peri-urban	1	1	3	1	4
	Rural	2	2	5	3	
SNNP/ Sidama Zone/Loko Abaya Woreda	Peri-urban	1	1	3	5	4
	Rural	2	2	5	3	
National						6
TOTAL		6 groups, 48 participants	6 groups, 48 participants	16	12	14

MAP 1: OROMIA REGIONAL MAP SHOWING AREA OF STUDY



Miz-Hasab Research Center, Addis Ababa, Ethiopia

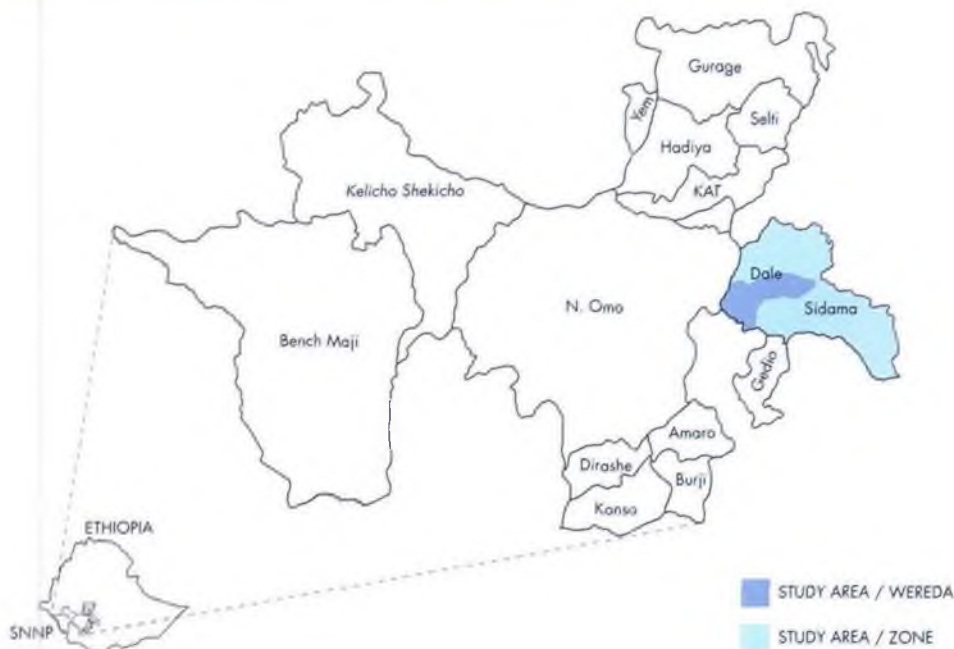
quently contributed to a rise in food prices in the area. The Awash River has recently been used for irrigation purposes, with the support of the government to help alleviate some of this decline in crop production. Lastly, tornadoes and endemic malaria also affect both rural and urban residents of Fentale Woreda.

The peri-urban residents of the study site of Merchara are predominantly small traders and government employees. With little knowledge and practice of family planning, both for economic and religious reasons, household sizes in Oromia are generally large, with an average lifetime number of 6.2 children.²⁵ Only 12.9 percent of currently married women throughout the entire Oromia area are using a modern method of contraception.²⁶

SOUTHERN NATIONS, NATIONALITIES AND PEOPLE'S REGION (SNNP)

The Sidama Zone is located in the eastern portion of the SNNP Region in southwestern Ethiopia. The town and the peasant association where the interviews were conducted are located in the Loka Abaya Woreda and include Hantere Town with a population of about 2,000. The area is generally classified as low-land and has been affected by recurrent drought and excessive heat. Deforestation is a prominent environmental issue—the large-scale loss of trees has resulted in farmland erosion and subsequent bareness. Additionally, the area faces severe water shortages that force the population to travel long distances in order to access water. Malaria is also endemic and considered one of the major health hazards of the area.

MAP 2: SNNP REGIONAL MAP SHOWING AREA OF STUDY



Miz-Hasab Research Center, Addis Ababa, Ethiopia

Peri-urban residents of the woreda are mainly government employees and small-scale traders, while most rural households practice subsistence farming and rely heavily on 'enseni' (nutritious bread made of the roots of *Ensete superbum*, or "false banana" trees) for food. Peri-urban residents also grow other crops like pepper and small numbers of coffee trees, both for consumption and to generate income.

To cope with current environmental problems, community residents, with the help of government safety net programs, are engaged in some development projects. In particular, the government is developing an irrigation system to benefit subsistence farmers living near rivers. Other projects include planting trees on barren lands and on hillside areas to help prevent further soil erosion.

Household sizes in this region are somewhat smaller than in Oromia, with an average lifetime number of 5.6 children.²⁷ Only 12 percent of currently married women are using a modern method of contraception throughout the SNNP region.²⁸

PARTICIPANT CHARACTERISTICS

Table 2 shows the background characteristics of the 96 participants in the focus group discussions from Oromia and SNNP. The background characteristics are listed here to provide a context for the study findings. The group of participants included in the study was not selected to be statistically representative, compared to national statistics. The study participants tended to be older, and thus had longer perspectives on changes in their communities and were better

educated about them. Furthermore, given that the peri-urban research sites were very close to the rural sites, on some characteristics, like education, the peri-urban and rural participants were more similar than if the study had included large urban areas, such as Addis Ababa. Background characteristics were not collected for government representatives and community leaders.

Among the 96 participants in the FGDs, half were men and half were women. On average, the men were older than the women (38 compared to 29 years of age). Around three-quarters of the participants (79 percent in Oromia and 73 percent in SNNP) were married. In both regions, participants reported living in households with an average of more than five people (5.2 in Oromia and 5.7 in SNNP). Household size was slightly higher in peri-urban than rural areas in both regions. Participants in both peri-urban and rural areas reported the same average number of children, 3.3. It should be noted that although the average number of children does reflect that fertility is similar in the peri-urban and rural areas, it is not an accurate reflection of the total fertility rate, or the average number of children a woman has in her lifetime, because participants were not asked detailed questions about fertility.

Participants from peri-urban and rural areas had similar educational backgrounds, with 13 percent of peri-urban and rural participants indicating they had not received any formal education. Participants from peri-urban areas were more likely to have attended university, although the overall rate of university education was very low. Among the participants, one male from a peri-urban area had attended university, while no participants from rural areas had done so. Female participants had generally received more schooling than men, which is not surprising since they were, on average, a decade younger than the male participants.

Most participants (67 percent in rural areas and 59 percent in peri-urban areas) in both regions had lived in their communities for more than 10 years. Participants from rural areas said that their households spent about 60 minutes a day collecting water, which is three times longer than the 23 minutes noted by peri-urban participants. The difference was particularly dramatic in Oromia, where virtually all peri-urban residents have water piped into their houses or compounds, compared to rural residents, who have to journey farther away for water.

The 96 FGD participants listed 20 occupations (not shown in Table 2). The three most frequently mentioned occupations were farmer (29%), pastoralist (15%), and government worker (14%). The only other occupation mentioned by more than five participants was merchant (8%).

Because the number of community members who participated in IDIs was small (16), their characteristics are not included in Table 2. Generally, these community members tended to be slightly older than the FGD participants, and had larger households (8 compared to 5.5 members).

Government officials and key community and national leaders ranged from a vice mayor to the heads and staff of departments responsible for: environmental protection; agricultural and rural development; disaster prevention and food security; water resources; youth and sports; security; public health; population, health and environment; and biodiversity conservation.

LIMITATIONS OF THE STUDY

Qualitative research is a powerful way to reflect the real voices of people surveyed, and it allows for a unique in-depth exploration of topics. The trade-off with this method is that it is not pos-

TABLE 2: BACKGROUND CHARACTERISTICS OF FGD PARTICIPANTS, BY REGION, RESIDENCE AND SEX, 2008

CHARACTERISTICS	OROMIA			SNNP			RESIDENCE		SEX	
	Total (N=48)	Rural (N=32)	Peri-urban (N=16)	Total (N=48)	Rural (N=32)	Peri-urban (N=16)	Rural (N=64)	Peri-urban (N=32)	Male (N=48)	Female (N=48)
Average Age	37.4	30.3	51.4	29.0	30.6	25.9	30.5	38.7	37.9	28.5
Average Number of Children	3.2	3.1	3.2	3.5	3.5	3.4	3.3	3.3	4.1	2.5
Married (percent)	79%	78%	81%	73%	72%	75%	75%	78%	83%	69%
Number of People in Household	5.2	5.0	5.6	5.7	5.5	5.9	5.3	5.8	6.3	4.5
Years in current community										
Less than one year	1	1					1			1
1-5 years	5	5		14	8	6	13	6	4	15
6-10 years	10	4	6	4	3	1	7	7	3	11
More than 10 years	32	22	10	30	21	9	43	19	41	21
Time spent by household collecting water (minutes)	29	43	2	66	76	45	60	23	46	49
Highest level of schooling completed (percent)										
None	23%	22%	25%	2%	3%		13%	13%	15%	10%
Some primary school	38%	44%	25%	21%	22%	19%	33%	22%	25%	33%
Completed primary school	2%		6%	10%	9%	13%	5%	9%	8%	4%
Some secondary school	10%	9%	13%	35%	34%	38%	22%	25%	25%	21%
Completed secondary school	13%	6%	25%	19%	22%	13%	14%	19%	19%	13%
Technical/Vocational Certificate	13%	19%		13%	9%	19%	14%	9%	6%	19%
University/College Diploma	2%		6%					3%	2%	

sible to generalize from the findings. Despite this limitation of the study's findings, which mostly reflect rural views and experiences regarding climate change, they are nonetheless important for understanding the social and human dimensions of climate change in regions where most Ethiopians have their livelihoods. This study complements other quantitative studies, including recent analysis of agriculture and climate change by the International Food Policy Research Institute and the Ethiopian Development Research Institute.²⁹

The research includes findings from peri-urban and rural areas; therefore, the views of Ethiopians from large urban areas are not included in this study. Participant characteristics are not representative of the country as a whole. Another limitation is the accuracy of participant recollections of changes in climate that required them to

differentiate between effects of changes in climate versus other factors, such as changes in human settlement patterns.^{30, 31, 32, 33} For example, the expansion of Beseka Lake in Oromia, which participants in that community attributed to climate change, is more likely due to other environmental and anthropogenic causes.³⁴

Despite these limitations, this study—as the first of its kind showing the links between experience dealing with climate change and views on population, family size and family planning—makes an important contribution to the existing literature and to the policy dialogue on adaptation to climate change.

The findings from the focus groups and in-depth interviews are divided into six sections, starting with a discussion of participants' knowledge of climate change and their experiences with weather-related events. The report then discusses the social groups that the study participants consider most vulnerable to climate change. We capture participants' (community members, policymakers, government representatives and other leaders) reflections on the changes that have taken place in their livelihoods as a result of climate change, as well as the links they make between climate change, population and family size. Finally, we discuss coping strategies participants say they use in their communities, as well as the measures that they think could make them more resilient to changes in climate.

1. KNOWLEDGE AND EXPERIENCE OF CLIMATE CHANGE

Almost all participants from both the Oromia and SNNP regions, as well as local and national-level participants, indicated having heard about climate change and cited local media (radio, television and newspapers), as well as school and government institutions as their main sources of information. Participants' descriptions of climate change ranged from personal observations of envi-

ronmental changes to more scientific information received from media sources.

Participants attributed recent environmental changes in their communities—in particular, deforestation, lack of rainfall and increasing temperatures—to climate change. Moreover, destruction of forests and subsequent soil erosion are frequently described as exacerbating climate changes in Ethiopia.

Climate change means when we are not taking care of plants in our area, when we fail to substitute them by replanting, when smoke emitted from big factories and industries pollutes the environment, when liquid wastes coming out of big factories pollute our rivers... when we fail to take care of plants in our area and fail to control soil erosion, we will face shortage of rainfall, and conditions associated with all of these events could be called climatic change. I have heard about climate change from radio, television and other communication medias.

(Oromia FGD, rural female, age 23, three children, occupation not specified).

One of the main reasons for this climate change is there is no forest in this area and the temperature is increasing because of this.

(SNNP IDI, peri-urban male, age 40, three children, merchant).

I think one indicator [of climate change] is the temperature increment, which is getting worse day to day. The other thing... is the absence of rain in some seasons, [for example], May last year.

(Addis Ababa, government representative).

Participants noted that lack of rainfall and increasingly hot temperatures have resulted in the degradation of farm and grazing lands, deforestation due to an increasing need to cut trees for charcoal production, increased food prices, food shortages, and in the Oromia region, flooding as a result of overflow from Beseka Lake.

Additionally, access to water was identified as a particularly important issue. A combination of decreased rainfall and increasing temperatures, which the participants identified as weather-related events associated with climate change, has led to the desiccation of wells and small lakes, which are crucial sources of water for many people. As a result of this severe shortage, people are forced to travel long distances to acquire water.

I have lived here [in Fentale Woreda] for 10 years. The climate change has caused high temperature increment in our woreda. We had hot daytime and medium nighttime temperature, but now it has increased. Other than that, forest trees are minimized, not only due to human intervention, but trees are just drying out and are taken for firewood. The other thing is that Beseka Lake is expanding from time to time... Since forests are diminishing, the soil is being eroded by floods and washed into the lake, lifting the lake higher... Other than that, the rainfall is unseasonal.

(Oromia FGD, rural male, age 36, two children, pastoralist).

The town has a very serious problem with regards to access to clean water.

(Oromia IDI, peri-urban male, age 48, three children, teacher).

If we need to give priority for [climate change impacts], the first is shortage of clean water... The second priority is [the] diminishing of forests.

(SNNP FGD, rural female, age 25, two children, community organization employee).

In earlier times, our woreda was very green, and there was no famine... In earlier times, everything was accessible in our area, but now everything has changed. We cannot get harvest after planting, and rain doesn't come on time as a result of these changes. Trees are cut for timber or for other unknown reasons.

(SNNP FGD, peri-urban female, age 25, three children, occupation not specified).

Additionally, some participants cast wider nets on their perceptions of the effects of climate change. For example, drought and failure of crops have resulted in dramatically increased food prices and food shortages, which some link to increased prices for many commodities. Dependence on food aid from government organizations or NGOs is also cited as a problem related to environmental changes.

Nowadays, the farmers face difficulties because fertilizer is expensive, [resulting] in the cost of food increasing. If the cost of food needs to be decreased, we should also decrease the cost of fertilizers. At the same time, the cost of other goods like blades, needles, soap, etc. is also increasing. The increase is persistent, and this is a challenge. The other one... is a problem of getting water supply. So the people need



A market place in Oromiya, Eastern Shewa Zone (Near Metehara Town)

to travel a long distance that takes four to five hours to get water.

(SNNP IDI, peri-urban community leader).

2. GROUPS MOST VULNERABLE TO CLIMATE CHANGE

Peri-urban and rural participants of both sexes in Oromia and SNNP mostly identified women and children as the groups that are most vulnerable to weather-related events. Elderly persons and the poor were also identified as particularly vulnerable, but those groups were mentioned less frequently than women and children (and clearly there is overlap, e.g., elderly women and poor children, although participants did not go into that level of detail in their responses). Men and wealthier individuals were cited as the least vulnerable to the weather-related events related to climatic changes.

In general, participants attributed women's increased vulnerability to their responsibility for the majority of household activities and childcare, a cultural norm throughout the area. In particular, women's responsibility to supply the family with water was identified as an activity increasingly affected by changes in climate, because it often requires women and girls to travel long distances, increasing their risk of physical harm, in addition to increased energy expenditure.

Women are the ones most affected by the drought because our culture has laid most activities on them. They do the labor, household activities and feed the cattle. For example, it's the woman who fetches water, even if it takes her a long time of journey. Other than that, since people don't practice family planning, women give birth to many children... women are also affected by birth-related problems.

(Oromia FGD, rural male, age 36, two children, pastoralist).

A woman after marriage will have children. At this time, since the climate is changing and the temperature is hot, she will be affected because she holds all the responsibility [for] the family.... The mother is not even able to get back the blood that she lost during delivery because she will be forced to go to work before she recovers from the birth pain.

(Oromia IDI, peri-urban male, age 48, three children, teacher).

The first to be affected are women.... They have the biggest work load.... and travel long distances to fetch water and are the ones who take care of children. They are also the ones who do household work and feed the family... In addition, when mothers are doing these activities, their daughters will be forced to help their mothers, as the daughters are the ones who are more close to mothers and who want to share their load, but boys do not do this.

(SNNP FGD, rural female, age 25, two children, community organization employee).

For children, community members describe the impacts of weather-related difficulties—likely drought and famine—as particularly severe and with long-term implications, especially regarding education. During times of weather-related difficulties, families may withdraw their children from school, either due to lack of finances or in order to migrate in search of better living conditions or employment. Children are also required to aid in household activities or to help support their families by working and in most cases, find it difficult to pursue an education. Malnutrition and increased susceptibility to diseases such as malaria were also almost universally cited as major issues affecting children as a result of climate changes. Participants from both areas and living in both peri-urban and rural settings emphasize that dur-

ing times of difficulty, the nutritional needs of children are not met, resulting in malnutrition, fatigue, inability to perform in school, increased incidence of disease and sometimes even death.

During difficult times, children, unlike other times, are highly affected by food shortages. Lack of balanced diet makes children susceptible to different malnutrition-related health problems. In addition, during difficult times, children are forced to keep cattle when the family moves, and they drop out of school. This problem is seen more in girls. Because by nature boys are stronger, and as the life of boys is more linked to cattle, their access to milk is also higher.

(Oromia IDI, rural male, age 46, 13 children, pastoralist).

My children don't even get proper sleep due to the heat. When they feel hot they get a rash on their body. They cry when this happens.

(Oromia IDI, peri-urban female, three children, teacher).

Children will be forced to stop [their] education due to [a] lack of water. For example, last year due to shortage of water, families together with their children were forced to [migrate] to a place called Abaya looking for water. At that time schools were closed... The other is children will suffer from diseases. Since we are using water from water harvesting ponds, children will be affected by different water-borne diseases. In addition, children will also be affected by problems associated with scarcity of food.

(SNNP FGD, rural female, age 19, two children).

Children need special care, but they may not be able to get this care during difficult times and hence they will be more affected. [C]hildren from the time of birth to six months need to get breastfed. Since mothers are not able to get balanced food, children will be affected. After six

months, children also need to get supplementary foods like milk, butter and eggs, but they are not able to get these during difficult times, and children, especially from poor families, will suffer more.

(SNNP FGD, peri-urban male, age 39, four children, government worker).

Unless they have better well-being, families will be affected by the number of children. Migration might be deemed necessary in times of draught, and a mother with six or seven children and another with one or two children can't equally face the problem. Children could die on the road; our history has shown us that. That kind of situation has occurred in the past 20-25 years. Children can't resist the draught, the long journey, dehydration and hunger... I think people with limited families have a better chance of survival.

(Addis Ababa, IDI, Researcher).

3. CHANGES IN LIVELIHOODS RELATED TO CLIMATE CHANGE

Climate changes have affected participants differently depending on their livelihoods (pastoral or agriculture) and their places of residence (rural or peri-urban). Pastoralists and farmers reported having to change aspects of their livelihoods in the face of changes in the environment. Some farmers described having to abandon their farms to make charcoal from local trees, and both agriculturalists and pastoralists reported having lost cattle to drought. Some mentioned increased potential for conflict as they shifted their livelihoods. Peri-urban residents identified high food prices and increasing costs of living as the most serious problems facing their communities.

In Fentale Woreda, with a large pastoral population, participants noted that climatic changes in recent years—such as decreased rainfall and the subsequent drying of grazing land—have resulted in major changes in daily life. Similarly, agricul-

turalists in the Loka Abaya Woreda are negatively affected by climatic changes, particularly by crop failures from lack of rainfall and temperature increases, and have had to change their typical livelihood practices as well.

The majority of farmers are displaced from their land and are working on processing charcoal, and some are migrating to cities. As there is no reasonable seasonable rainfall, it's impossible to cultivate land. Cattle are dying and forests are being destroyed.

(Oromia FGD, rural female, age 23, three children).

The way we live is very difficult; we must walk even when our leg[s] [are] broken. We pastoralist people travel in search of grass and water and will settle in places where there is rain. And we face a lot of problems during migration. We are neighbors to Afar in one side, Amhara in another side; this side is the sugar factory and the park is on the other side. Therefore, while traveling we will fight with people in the surrounding [areas] and people may die. The other is we will be forced to eat and damage government belongings. For example, this park is protected, but during drought we will be forced to go into the park. The same thing will happen with the sugarcane plant of the sugar factory. Related to this people will die, people will be arrested and all this is happening due to the climate change.
(Oromia FGD, rural male, age 39, eight children, pastoralist).

Life is not as before; that means you do the work for survival now. The old times are gone forever. Before, I worked for some time and I got enough to live and support my family. But now I work a lot harder for much longer time periods, and this helps me [only] to feed my children. I don't want them to starve, because things are getting worse. Everything is getting expensive, something that was 10 birr before is now 40

birr. So I am working to get that 40 birr.
(*Oromia IDI, peri-urban female, age 40, nine children, nurse*).

In the past, when we had enough rainfall, we used to get a good harvest from our farm. But now we plant crops but there are times [when] they won't grow. We buy fertilizers [at] high prices ... but at times we come out with nothing. So this affects our economy and puts us in bankruptcy.
(*SNNP FGD, rural male, age 35, six children, farmer*).

In earlier times, fuel wood was easily accessible, but now those people who are not able to buy kerosene are traveling long distances to get fuel wood.
(*SNNP FGD, peri-urban female, age 20, two children, unemployed*).

4. LINKING CLIMATE CHANGE TO POPULATION AND FAMILY SIZE

Participants—most notably from SNNP, where pressure on agricultural land is growing stronger—frequently and without probing mentioned population growth as a contributing factor in or as a main cause of the environmental changes they had observed. For participants from SNNP, population growth, linked with a decline in forests, was perceived as one of the most important causes of the climate changes.

I think the major problem is population increase, not diminishing forest reserves, because it is population increase that causes the loss of forests. In the past when few people lived in this area, it had huge forest reserves, but as the population increased, forests got damaged.
(*SNNP FGD, rural male, age 38, six children, farmer*).

I have also witnessed the climate change. The deforestation in our area is linked to the increasing human population. The serious desertification that we see in our country is the result of climate change.
(*SNNP FGD, peri-urban male, age 36, five children, government worker*).

The land which was covered by forest, has, as a result of population growth, shifted to farming land. In addition, people are cutting trees and making charcoal. Climate change comes through time.
(*SNNP FGD, rural female, age 25, three children, government worker*).

In general, population growth has its own impact on climate change. When we see the case of a family, [having] more family members has its own impact. It is difficult to produce enough from a small area of land for unlimited number of children in a family.
(*SNNP, government representative*).

Because of the specialized needs of women and children, participants noted that the number of children in a household is an important determinant of a household's ability to support itself in the face of current economic and environmental conditions. People said that the historically prevalent attitude toward the number of children per family in Ethiopia has been to have as many children as possible and let God's will provide the necessary resources to raise them. Women are also granted prestige within their families and communities based upon the number of children they have. Children may also play an economic role in the family by providing labor for pastoral or agricultural practices and thus have traditionally been considered an asset rather than a burden.

As to the attitude of several people of the area, having more children is advantageous in help-

ing the family through grazing the cattle in the fields. Furthermore, they travel long distances... so that the more children they have, the better they manage their cattle. Additionally, having a greater number of children is considered a source of pride for women in the area.

(Oromia FGD, rural female, age 24, community organization employee).

If a person doesn't have ten children he will be considered as a person with nothing.

(Oromia FGD, rural male, age 38, five children, pastoralist).

These attitudes favoring large families are changing, especially in recent years, partially due to the introduction of family planning. Participants identify families with fewer children as better positioned to deal with current challenges, including environmentally-related difficulties.

In earlier times, people said that children are gifts from God and God knows how they will grow. But now they are saying that we can have children and we need to save money also. It is only with resources that we can have more, and if there is [a] problem raising children, it is better to have few. Maybe those that have resources will not understand it, but those that are having problems and those that are having more children are understanding the need for family planning.

(Oromia IDI, rural male, age 38, three children, government worker).

Yes, it is known that [having an] unlimited number of children is a problem for the family. If we see two households with two or three children and with ten children, the one with few children will be better off. For the household with few children, it is easy to feed all the children balanced food and to give them a good education... With this regard, in recent years [through] a program from the government, family planning

is extending into the community and people are using [it]. In earlier years, women were taking pills without the knowledge of the men. But now men are also realizing the problem, and family planning methods are practiced after discussion of the husband and the wife.

(SNNP FGD, peri-urban male, age 36, five children, government worker).

Having an unlimited number of children leads to problems. [People] need to use contraceptives and limit their number of children. If they are not using contraceptives, they will have more children and when the resources in the household are limited, it will not be enough to feed all the children.

(SNNP IDI, rural female, age 19, no children).

However, some barriers still exist to the implementation of family planning in Ethiopia—cultural pressures to bear more children, incorrect knowledge of religious tenets and a lack of contraceptive knowledge.

As far as our area is concerned, the government is teaching us about family planning and is providing the required medicines. The community, as it is impossible to feed all the children, is forced to use the family planning services. We are now noticing better changes. But [some people believe that] it is forbidden by our religion in our 'Sharia' [Islamic law] to take family planning tablets. However, the community by itself is using the tablet [oral contraception] or is having a child after enough [a gap of enough] years. The community is also accepting the education and using the family planning.

(Oromia IDI, rural female, age 50, five children, pastoralist).

[Having a child] occurs only when God lets [a person] have one. And there is a problem in using pregnancy pills. The pills sometimes cause death. So you accept what God brings you. Of

course it's good to not have [many children].
(*Oromia FGD, peri-urban male, age 67, three children*).

In some interviews, participants revealed a preference to having sons over daughters, although this gender-inequitable perspective appears to be changing due to the necessity of limiting family size.

As far as I am concerned, having more children is not useful. One or two children in a household are enough. I think it is good if one is male and the other is female. I have four children, and it was to get a proportional number of male and female children. But I have only one son and I feel that [wanting to have more children to have a balance of boys and girls] is not good.
(*Oromia FGD, peri-urban female, age 30, four children, secretary*).

Participants also note a discrepancy between the number of children a household has typically had in the past and the number of children most households can currently sustain.

There was no concept of family planning in our time. It's recently that it is becoming a concept... I have six children. My last child was born ten years after the previous child... I didn't raise them well, because it would have been [easier to help them succeed] if they were two or three, but since they are six, I have harmed myself and harmed them, too. I would say it's not good to have more than three children.
(*Oromia FGD, peri-urban male, age 68, six children*).

Everyone needs to have children based on the resources [they have], and I feel two to four children are enough.
(*SNNP FGD, peri-urban female, age 22, three children*).

5. COMMUNITY COPING STRATEGIES AND RESILIENCE

Coping Strategies

Community members attempt, with varying levels of success, to cope with weather-related events. Importantly, local knowledge regarding traditional livelihoods was identified as important for the development of new adaptation strategies. Among the rural agriculturalists, temporary migration and attempting to collect water by digging wells were both mentioned as frequently employed coping strategies. However, a lack of rainfall and evaporation related to increasing temperatures impede water collection. Participants also view migration to other rural areas as more challenging because of a widespread lack of arable or grazing land due to deforestation, erosion and other environmental degradation, and population pressures.

Even if our farmers are not educated, they know a lot of things. For example, most of the participants here are farmers. For example, I can mention this person and he has a plantation that can keep soil fertile. He considers these plants as his children. This comes from realizing the problem first. The other is collecting grains in storage. This is also another solution to mitigate problems. There is no one cutting trees at this time, and the government is also teaching the community, and the problem [of climate change] itself is also teaching [us]. Household heads will travel long distances with cattle during drought time and the children will stay at home as a reserve keeping animals around. In addition, the community now understands the importance of family planning.

(*SNNP FGD, peri-urban male, age 26, three children, government worker/agriculturalist*).

To cope with this change, people start to harvest and supply vegetables for the market. If they don't get profit by doing this, they change

their business into other fields. The other thing is that there is only one water tap in this area, so it becomes hard to get water because of this. So, we do some pot irrigation activities in the raining season in order to use the water for the summer. *Since there is only one site for pot irrigation, all the people use water from this and the water is finished quickly. Because of the presence of a clinic in this area, the community has started to use birth control methods and give birth by planning.*

(SNNP IDI, rural female, age 30, six children, farmer).

Community members also indicated that they often rely on social capital resources that have traditionally existed in both the Oromia and SNNP areas. Established social support mechanisms include ikubs and idirs, informal savings and loan associations, membership into which helps guarantee support in the form of money or cattle in times of need. However, during times of extended and extreme hardships, the community turns to the local government for support and expects that adaptation measures such as irrigation will be implemented in their areas by the national government.

They were bringing water from other places with cars and tankers [to cope with bad weather]. It becomes hard to cultivate because it does not rain on time. Nothing was grown.

(SNNP IDI, peri-urban female, age 35, four children, merchant/agriculturalist).

Since the Ethiopian [calendar year] 1997, there has been a safety net program which was planned for five years in this area. Consequently, around 11 kebeles [Ethiopia's smallest governmental administrative unit] have been supported [by] food crops... and there is a thing named 'food for work,' in which people work like planting trees, building dams in eroded areas, constructing roads and so on. In doing so, they

cope [with] the problems they face.

(Oromia FGD, rural female, age 24, two children, community organization employee).

Despite some available coping strategies used to deal with climate changes, participants were not always able to deal with existing environmental problems without struggle, and often emphasized the need for more assistance.

[During past times of weather-related hardship], our household coped with the changes with great difficulty. We asked for a loan and ate what we got by sharing. We were in very serious trouble and we passed the time with God's help.

(SNNP IDI, rural female, age 19, no children).

In Fentale Woreda, Oromia, residents have supplemented typical pastoral practices by implementing some small-scale agriculture, in particular growing and selling onions, pepper and tomatoes. The Ethiopian government is providing assistance in the organization of cooperatives to facilitate the sale of these products at stores provided by the kebeles. The implication of this assistance, however, is that most community members now rely on government and NGO-initiated coping strategies for survival. These strategies include a safety net program intended to engage community members to participate in activities such as building dams to prevent flooding, planting trees in highly deforested areas, and weeding the Beseka Lake to help prevent overflowing. Government programs also focus on irrigation; a major irrigation program in the area has allowed an increase in agricultural production and therefore a change from the traditional pastoral livelihood practices of the area. During hard times, residents of Fentale Woreda also frequently seek temporary employment at a large sugar factory near the woreda's peri-urban area.

The community is working with the government to address problems related to climatic change. Grouping into safety nets, doing developmental activities, form[ing] groups, obtaining loans from microfinance and creating income-generating activities are some of the [things that] help. People are encouraged to replant trees... I hear there is an irrigation project... This has changed the work culture of the community, and people are participating. People who were raising many cattle are now educated to fatten some cattle in a suitable area. Others are educated to limit family size and are helped to get pure water. (Oromia FGD, rural male, age 23, two children, pastoralist).

Some participants in both Oromia and SNNP also mentioned the "Two trees for 2000" campaign launched by the President of Ethiopia at the turn of the Ethiopian millennium to encourage Ethiopians to plant trees.

[Using the] slogan of 'two trees for 2000' we can enhance the awareness of the society... This improves the weather situation. (Oromia, policymaker).

For rural participants, migration to peri-urban centers in search of employment was identified as a strategy to help alleviate the impacts of poor crop yield or loss of livestock. Participants also stressed the need to reduce household expenditures, including reducing food intake as necessary in times of difficulty (weather and otherwise), and, as a last resort, selling property, including cattle and other livestock. As previously mentioned, the widespread practice of cutting local trees to make and sell charcoal was also frequently identified as a coping strategy for climate-induced declines in crop or cattle productivity.

Thinking about our living condition seriously hurts your mind. Those with serious harm will be forced to cut trees, make charcoal and sell it in

Metahara town. Then he will use the money to buy cheap food and feed his children. Sometimes, you will sell one or two of your cattle and try to escape the hard time. In other times, we plant crops on our land and try to escape the hard time by using the little harvest that we could get.

(Oromia IDI, rural female, age 50, five children, pastoralist).

Some participants stated that they do not feel prepared for current and upcoming climate changes, and others expressed serious concern about their communities' ability to cope. Still others considered resilience up to God.

I've not prepared any such plan [to deal with climate change]. I guess I'll face the consequences as they come.

(Oromia IDI, peri-urban female, age 38, three children, teacher).

[Environmental changes] have caused people to lose their courage, made them at risk for various health problems, and dependent on aid support, which was considered a [humiliation] in the past. Now with their lost nerve, in despair and due to the inflated value of food crops, they are in serious trouble.

(SNNP FGD, rural male, age 39, five children, farmer).

It is not possible to make a plan for tomorrow. It is the will of God.

(SNNP IDI, peri-urban female, age 35, four children, merchant).

Government and NGO assistance as well as community support were also frequently identified as important conduits of coping strategies to help mitigate the negative environmental effects participants are currently experiencing.



Beseka Lake in urban Oromiya, threatening to flood agricultural land.

It is God who gives help to people, because it is God that give[s] protection. [At the same time], we need to help each other. Like a father giving help for his kids, we get help from NGOs, and we think these also help. The community within [various] ethnic groups is also helping one another like [in] earlier times. That is how we are living now.

(Oromia FGD, rural male, age 39, eight children, pastoralist).

Increasing Resilience

Study participants identified various strategies that would help them become more resilient to the climate changes that have already occurred and those that will occur in the future. Not surprisingly, given the close link between coping and resilience, many of the resilience strategies mentioned are the same as those mentioned in the previous section on coping strategies. In particular, irrigation, loans for microfinance projects, migration to less affected areas and replanting trees were repeatedly mentioned as adaptation

strategies that would increase resilience. For farmers, soil and water conservation achieved through strategies such as terrace farming were suggested by participants as solutions for loss of agricultural productivity due to climate change, soil degradation and deforestation. Varying the types of crops planted to include more drought-resistant species as well as vegetables with high marketplace values were also identified as possible strategies for the current economic and climate issues.

Noting past events, including famine when people lost their lives, participants repeatedly said that the government needs to increase people's resilience to cope with the changes in climate, which is causing more frequent episodes of draught and catastrophic flooding. A prominent theme throughout both focus group discussions and in-depth interviews was a general sentiment that the government is responsible for helping communities.

[During previous droughts], at that time the people do their work to cope with it and the people

who live around [these] areas... made a report when famine started and the government gave aid for those people who do not have a potential [to support themselves]. People lost their lives and suffered because of this famine.
(SNNP IDI, peri-urban male, age 40, three children, merchant/agriculturalist).

When we have no rain and a drought is [expected], we will be forced to look for government aid.
(SNNP IDI, rural female, age 30, six children, farmer).

Participants found particularly useful government and NGO assistance programs to include irrigation schemes, resettlement programs for pastoralists, micro-finance projects, disaster preparation and a safety net program implemented by local disaster prevention agencies.

There is a committee organized by the accident preparation and prevention agency. Their task is assessing areas where weather-related difficulties are getting worse and then following with support in accordance. In cases where the circumstances are severe, people are not forced to do jobs, but simply sit idle and get supported by the agency.
(Oromia FGD, rural female, age 28, two children, community organization employee).

To tell you the truth, most rainy seasons in our area are known to be associated with flooding. We do preparations for the flood by clearing canals and constructing ridges and dams in collaboration with some other institutions. In addition, two years before, we started environmental management practice like clearing mosquito larvae breeding sites as a measure to protect the community from malaria. We clear canals to avoid stagnant water.... Disaster preparedness is not a common phenomenon in our area. During the rainy season, we frequently follow radio

and TV to take preparations for flood.
(Oromia FGD, peri-urban male, age 36, two children, manager/merchant).

There are a lot of things that are done by the government. The government is working to change the lifestyle of the people from pastoralist to agricultural farming and the government is also seriously working to improve the livelihood of the people from agriculture... An irrigation project is established to cover eleven kebeles. Three kebeles are not using the irrigation schemes. The other is, as far as education is concerned... now there is at least one school in each kebele. There are also kebeles that have two or three schools. Therefore, as far as our change is concerned, our people totally rely on the government.
(Oromia FGD, rural male, age 29, two children, pastoralist).

We have a shortage of clean water. To protect this, the government needs to dig a water well and develop water for us... In addition, the community needs to care for pond pollution. The other is working effectively by having the collaborative efforts of the community and the government on soil and water conservation activities. For example, by using terraces.
(SNNP FGD, rural female, age 25, two children, community organization employee).

Access to Family Planning and Reproductive Health Services

Participants frequently mentioned family planning as a component of adaptation strategies that would boost resilience.

The government has to give education for the community and give training about climate change, family planning, and loan and saving activities.

(Oromia IDI, rural male, age 60, 10 children, pastoralist).

The only solution to adapt to climate change is to [undertake] agricultural activities [along with pastoral activities] in order [to] fulfill the needs for food and start to use family planning services and quit marriage with many wives... By doing this, they are going to be able [to] adapt [to] the situation.

(Oromia IDI, rural female, age 37, five children, pastoralist/agriculturalist).

We prefer to have enough gap between children. We want to have less than four children. We are using family planning and we also believe that we have to give advice for others about family planning. We also use our resources effectively and avoid extravagancy.

(SNNP FGD, peri-urban female, age 25, three children, merchant/agriculturalist).

In addition to a growing acceptance of family planning, most participants said that they had access to reproductive health and family planning services, especially through government sponsored health posts. Participants also noted that in addition to an increased use of family planning in recent years, family planning education was also becoming more widespread.

Earlier on we say that it is God who helps children to grow and we don't accept family planning. But now, since health posts are found everywhere and professionals are giving education for the community, the community is using family planning services.

(Oromia IDI, rural female, age 37, five children, pastoralist).

The government is giving lessons on family planning. The society is also accepting and practicing it.

(SNNP IDI, urban male, age 40, three children, merchant/agriculturalist).

Despite a growing acceptance of the need for family planning to control population growth and maximize resources, access to reproductive health and family planning services is not always constant. Participants identified insufficient supplies of family planning commodities as well as lack of economic means to purchase contraception as barriers to using family planning, especially in times of drought.

When there is a drought there is famine, and when there is famine there is poverty. If family planning [is] a service that we get by paying money during times of difficulty, we couldn't use the service as we don't have money.

(SNNP IDI, rural female, age 18, no children).

DISCUSSION AND RECOMMENDATIONS

4

In designing global, national and local strategies to promote adaptation to climate changes, it is critical to hear the voices of those most affected by these changes, along with those of community leaders, policymakers, government representatives and other leaders who are entrusted with designing programs to strengthen adaptation. In this study, women and men from two areas of Ethiopia have spoken eloquently about the increasing challenges they face in adapting to climate change: they recounted how rising temperatures, more frequent draughts and, paradoxically, increased flooding, receding agricultural grazing land and diminishing forests are making it more difficult for their families and communities to cope. These reflections on increasing hardship are coming from people who are accustomed to enduring struggle to survive. From their own experiences, they link population pressure to the effects of climate change and report that families should consider having less children to avoid as much hardship in making a living and in utilizing natural resources for survival. They highlighted the particular vulnerabilities of women and children. They spoke of communities coming together to promote coping strategies and the need for government assistance in the face of increasing frequency of adverse events caused by the effects of climate change.

In summary, many participants in Oromia and SNNP, Ethiopia, from both peri-urban and rural areas, among both male and female community members, among farmers, pastoralists and other workers and among policymakers, government representatives and other leaders report that they:

- **Acknowledge that climate change is occurring and notice changes in their environments**—most notably, higher temperatures, less precipitation, unseasonal rainfall and drought—which are leading to food and water shortages, among other effects.
- **Identify women, children and the elderly as the groups most vulnerable to and affected by climate change.** Households are stressed by climate change, principally by food and water shortages. Women, in particular, are highlighted as vulnerable because of their increased household workload, i.e., traveling longer distances to get water, reducing their food intake and taking care of children, among other activities. Children also suffer ill effects from temperature rises and droughts.
- **Encourage the use of family planning by observing that large families of six or more children, while culturally desirable, are not**

currently sustainable. Many participants—both men and women, peri-urban and rural—identified the need for increased family planning information and education and the use of contraception to deal with the climate changes, in addition to more traditional adaptation strategies, such as irrigation, reforestation and soil conservation.

- **Believe that while climate change is inevitable and that some alleviation may be up to God, the government should take lead in addressing climate change.** For example, many participants reported a need for government aid through irrigation, reforestation, community development schemes and provision of family planning services. Many participants also noted that in addition to government intervention, communities should support each other during times of extreme climate change.

This study links the concepts of population, fertility and family size to notions of vulnerability and resilience to climate change in Ethiopia. Its findings can help inform policy dialogue on adaptation and the role of family planning as an adaptation strategy, and enrich understanding of global perspectives of climate change, vulnerability, resilience and adaptation.

Based on these findings, this research leads to the following recommendations for the government of Ethiopia, donors, the UN Framework Convention on Climate Change (UNFCCC) and researchers:

- 1 Support integrated approaches to climate change adaptation that build on people's expressed needs, and strengthen community-based adaptation strategies to include expanding access to reproductive health and family planning services.**

Strengthening agricultural practices, irrigation schemes and other activities to preserve water, reforestation, microfinance, health and family planning were all mentioned by survey participants as important to improving their resilience to climate change. Most of these strategies are part of Ethiopia's 2007 National Adaptation Programme of Action (NAPA) and should continue to be implemented by the government, NGOs and within communities as integrated programs.

Furthermore, as Ethiopia moves to develop a longer-term adaptation strategy (moving forward from its NAPA), it should include voluntary reproductive health and family planning as a core component of integrated community approaches, and also involve strengthening the country's national family planning program. Ethiopia has several policies addressing population, poverty, reproductive health and climate change; these policies should be integrated to better coordinate and target their impact. In addition, the plans and funding for implementation of family planning and reproductive health services should be strengthened, through both the national family planning program and through integrated community adaptation programs.

As the UNFCCC moves forward with discussions on longer-term adaptation strategies, it should support strategies that foster integrated approaches to strengthening resilience to the effects of climate change. Advocates can play an important role in ensuring that longer-term adaptation approaches meet the full range of needs of people affected by climate change.

- 2 Give more high-level policy support to Ethiopia's reproductive health and family planning programs to reduce the high unmet need for contraception and to improve maternal and child health.**



Rural SNNPR housing construction, Sidama Zone, Loko Abaya Wereda.

The government of Ethiopia should review its *commitment to reproductive health and family planning*. High-level policy support is critical to ensuring that these services are available to women and men who want to use them. In Ethiopia, 34 percent of women of reproductive age say they want to stop having children or wait before they bear their next child, and yet are not using contraception. This unmet need for family planning is even higher in the Oromia and SNNP regions, at 41.1 and 37.4 percent, respectively.³⁵

Since nearly eight in 10 women who obtain family planning do so from government sources, the government of Ethiopia must significantly expand its efforts within health centers, health clinics and health posts to provide family planning services to women and couples who express a desire to slow or stop childbearing. Notably, the public sector is the leading source of injectable contraception, the most popular method in the country;³⁶ the government could also support the private sector and NGOs to expand these services.

Moreover, the prevailing perception that women and children are currently and will continue to be the populations most affected by climate changes necessitates an increased focus on comprehensive maternal and child health programs.

3 Researchers should include population growth, fertility and access to family planning and reproductive health services in future studies of impacts, adaptation and vulnerability to climate change.

This study has paved the way in showing that many Ethiopians do think of family size when they conceptualize their ability and the ability of their communities to adapt to climate change. Future studies to assess resilience and adaptive capacity should include components on fertility, reproductive health and access to family planning services.

ATTACHMENT 1: SUMMARY OF QUESTIONS, BY RESPONDENT

National level policymaker interviews:

- Do you think climate change is affecting Ethiopia? If so, how?
- How do you think climate change will affect Ethiopia in the future? [Health? Economic impacts? Agriculture? Food security? Environmental sustainability?].
- In what ways are you preparing for the effects of climate change in your work?
- Will climate change impact your agency's ability to meet its goals? If so, how?
- Among the challenges facing you as a leader, can you describe the relative importance of climate change? How much of a priority is this issue for your organization?
- Does your agency have plans for counteracting the effects of climate change? Does your organization have plans to facilitate adaptation to climate change?
- Are there groups of people in your community who are more vulnerable to climate change impacts? [e.g., flooding, drought, food inse-

curity, access to water]. If so, please describe these groups. [e.g., the elderly, children, men vs. women, ethnic groups, occupational groups].

- How does the number of children in a family influence its ability to cope with and recover from weather-related problems? [e.g., drought, flooding].

Community leader interviews:

- Have you observed changes in the climate over the past few years? [Flooding? Drought? Changes in rainfall patterns or growing seasons?].
- Do you think climate change is affecting your community? If so, how?
- Can you tell us about a time when people in your community had to significantly change their lifestyles due to weather-related events? [Probes: Difficulty in accessing water? Increase in food prices or food scarcity? Damage to your housing? Agricultural practices?].
- What types of things did people in your community do to cope with these lifestyle changes, and how difficult was it to make them? [Probes: Conserving soil? Planting trees? Using different

crop varieties? Irrigating? Changing planting dates? Using different water sources? Migrating?].

- How do you think climate change will affect your community in the future? [Health? Economic livelihoods? Agriculture? Food security? Environmental sustainability?].
- Are there ways that you are preparing for the effects of climate change in your work as a community leader? If so, can you describe them?
- Among the challenges facing your community, can you describe the relative importance of climate change?
- In your opinion, what interventions would best help your community adapt to future changes in climate?
- Are there groups of people in your community who are more vulnerable to climate change impacts than others? [e.g., flooding, drought, food insecurity, access to water]. Please describe these groups. [e.g., the elderly, children, men vs. women, ethnic groups, occupational groups].
- How does the number of children in a family influence its ability to cope with and recover from weather-related problems? [e.g., drought, flooding].

Interviews with urban and rural individuals experiencing climate change: Experience of Weather-related Events

- Have you heard of climate change? What does this mean to you?
- What are the most important changes, if any, that you have noticed in your environment in recent years?

- Different environmental changes affect people to a greater degree than others. We have created cards representing various environmental impacts and would like you to sort them according to the impacts most important to you and your community. [Pile sort environmental impacts: fewer trees, sewage, availability of wood, availability of charcoal, water contamination, availability of water, crop failure, decreased rainfall, poor crop growth, etc.]

- Can you tell us about a time when you or people in your community had to change your daily life or lifestyle due to weather-related events? [Probes: Difficulty in accessing water? Increase in food prices, or food scarcity? Damage to your housing? Agricultural practices?].

- What types of things did you or others in your community do to cope with these lifestyle changes, and how difficult was it to make them? [Probes: Conserving soil? Planting trees? Using different crop varieties? Irrigating? Changing planting dates? Using different water sources? Migrating?].

- Different groups of people are more vulnerable to weather-related changes than others for various reasons. We have created cards representing different groups in your community [Pile sort: men, women, children, elderly, poor, wealthy, etc.]. We would like you to arrange these cards based on who you think is the most vulnerable to weather-related events, and explain your choices.

- Let's focus on children from this list of vulnerable groups. During times of weather-related difficulty, what were the impacts on children in your community? [Changes in nutrition? Their schooling? Health?].

- How does the number of children in a family affect their ability to cope with changes in

their lives brought about by changes in climate? [How would having more children help? How would having fewer children help? How many children would be considered ideal? How many children do couples have, in general, in the community?].

- Do you currently have access to reproductive health services (these include services necessary to plan pregnancies and to have a healthy child, including family planning services, sexually transmitted infection (STI) prevention and treatment, and skilled birth attendants). Where do you get these services? [Through a health post? A clinic? A pharmacy? A hospital? Another service site?]. Has your access to these services ever been interrupted during times of weather-related difficulty?
- Are there any pressures to have children or to not use family planning services, for example, people in your community who think you should have a certain number of children?

Financial Resources

- In times of weather-related difficulty, like the ones we discussed, where do people in your community turn for financial help? [Do you have ways to earn extra money/food/necessities? Do you borrow money? From friends? Family? Lenders?].

Resilience

- If in the future, weather will become less predictable, with more droughts and unsure rainfall, what do you think would help you adapt to these changes? [Probes: Migrate to another area? Sell land? Have fewer children? Have more children?].

ENDNOTES

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