

# GENDER DIMENSION IMPACTS OF CLIMATE CHANGE AT WEST BELLESSA DISTRICT, NORTHEAST ETHIOPIA

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## ABSTRACT

*Both women and men are vulnerable to the impact of climate change. So, the overall objective of this study was to assess the gender dimension impacts of climate change at West Bellessa District, Northeast Ethiopia. Both primary and secondary data sources were used. Longitudinal and cross-sectional research design with multi stage sampling procedure was used to select 184 respondents. The result of the study indicated that drought, stress, increasing temperature, scarcity of water, decreasing food crops, floods, displacement, water born disease, early offset rain, late onset rain, malaria and conflicts were the major impacts of climate change in the study area. Stress, scarcity of water, water born disease and drought were more affecting women. Floods, displacement, early offset rain and late onset rain were more affecting men. This implies that climate change impacts affects women and men differently because of their gender roles. Therefore, any climate change adaptation strategies should consider gender issues.*

**Keywords:** *Climate change, impacts, Gender*

## 1. INTRODUCTION

### 1.1. Background of the Study

Scientific evidence point out that climate change has impersonated intense effects on the wellbeing of citizens in countries throughout the world (Dube and Phiri, 2013; Mubaya *et al.*, 2012; Shaw *et al.*, 2011). Developing countries are suffered most from the negative impacts of climate change (IPCC, 2007). This is due to the economic importance of climate- sensitive sectors for these countries and to their limited human, institutional and financial capacity to anticipate and respond to the direct and indirect

effects of climate change. This is true in Africa including Ethiopia where there is high direct dependence on the natural environment for livelihood and high levels of poverty (Dixon *et al.*, 2001; Alexandrov and Hoogeboom, 2000).

Ethiopia is one of the most vulnerable country to climate change and extremes (Temesgen, 2010). More than three quarters of the population in Ethiopia live in rural areas. They are contributing 45% of GDP in crop production and 90% for export value in the country (World bank, 2009). However, the majority of the population is engaged in

rain-fed traditional farming systems and economic development. They heavily dependent on agriculture and natural resources, which are more sensitive to climate change. Thus, vulnerable livelihoods and national economic growth are likely to be highly affected by climate change and extreme weather events (Temesgen, 2010).

In Amhara region, climate change is the major problem. From the total districts, 51% districts are currently food insecure and all are located in the eastern part of the Amhara National regional State (ANRS). Overall, 2-3 million people are chronically food insecure accounting for one-third of the chronically food insecure and vulnerable people in the country (Arega, 2013).

West Bellessa is also one of the district in ANRS. The district where localized temporal rainfall and temperature variation during cropping season induces the main challenges to crop production and in turn to food insecurity (West Bellessa Agricultural Office Report, 2018).

Declining crop production will likely increase the risks of food and nutrition insecurity. High levels of food insecurity and water stress may lead to higher rates of malnutrition and susceptibility to other diseases (Arega, 2013; Birhanu and Shiferaw, 2009).

Studies have been conducted on climate related issue in Africa. For example: (Wrigley *et al*, 2017) in Ghana, (Guloba, 2014) in Uganda and (Majaliwa *et al.*, 2010) in Uganda. These studies indicated that increasing temperature and declining precipitation significantly affect agriculture and livelihood resources. But, results were highly aggregated over larger geographical areas.

At national level studies also conducted on climate change impacts and adaptation related issues. For instance: (Tigabie, 2018), (Zegeye, 2018) and (Zegeye and Gebeyehu, 2016). The result of the studies revealed that the impacts of climate change but they didn't show the gender dimension effects of climate change.

Both women and men are vulnerable to the effect of climate change. However, the magnitude of the effect differs. Because women and men have different levels of

access to extension and climate information, gender-differentiated roles in the household and community, gender inequality in access to social and physical goods (Tsfamichael, 2016).

Studies have been conducted on climate change impacts and gender. For instance, (Global Gender and Climate Alliance, 2016), (Tsfamichael, 2016), (Guto, 2014) and (Aklilu and Desalegn, 2013). Yet, they didn't show who are more vulnerable in which climate change effects.

In general, the above studies indicated that the impacts of climate change. However, the results were highly aggregated over larger geographical areas and they failed to address the gender dimension impacts of climate change. Moreover, there is little study in the study area regarding to gender dimension impacts of climate change. Therefore, this study tried to fill this gap.

## 1.2. Objective of the Study

The overall objective of this study was to assess the gender dimension impacts of climate change at West Bellessa District, Northeast Ethiopia. Specifically, the study identified the impacts of climate change and its impacts on women and men in the study area.

## 1.3. Research Questions

1. What are the impact of climate change in the study area?
2. Which impact of climate change affects women and men?

## 2. DESCRIPTION OF THE STUDY AREA AND RESEARCH METHODS

### 2.1. Description of the Study Area

West Bellessa is located southeast of central Gondar Zone which is 84km away from Gondar town. It is bordered by Wogera district in the north, Libo-kemkem and Ebinat districts in the south, Gondar zuria district in the west and East Bellessa district in the east. Currently, it has 29 rural and one small scale urban kebeles but the study was conducted in Filiklik, Koza and Gulana kebeles. Arbaya is the name of the district town. Its altitude varies from 1500-2500mas (West Bellessa Agricultural Office Report, 2018). In West Bellessa, the average annual temperature ranges from 16.2 to 33.6°C. The annual rainfall also ranges

from 451.81 to 1446.1 mm. The climate of the area is characterized mainly by warm and dry climate with relatively low rainfall amount. The agro-ecological zone of the woreda covers 58% kola, 38% woynadega and 1.5% dega. The total land coverage of the area is 113,090 hectares. From this, cultivated land covers 41.9%. The agricultural system is traditional subsistence mixed farming type. The main types of crops like Teff, Sorghum and Chickpea are grown in the district.

West Bellessa district is identified as one of the food insecure district in central Gondar zone due to the widespread extreme climate shocks mainly to prolonged drought. As result from 12 rural kebeles of the district a total of 36,266 households have been supported by government through productive safety Net program to fill their food gap (West Bellessa Agricultural Office Report, 2018).

## 2.2. Research Methods

### 2.2.1. Research Design

The research design applied in this study was both longitudinal and cross sectional study design. In longitudinal collected crop production data from district agricultural office. Moreover, the study used cross sectional which are completed a single respondent at a single point in time through combining both quantitative and qualitative research approaches. According to (Creswell, 2007), the use of quantitative method has the potential of covering many subjects to enable generalization and address various issues at a time. The qualitative method on the other hand, is used to supplement the data gathered using household survey and enable to get in-depth information about the opinion and perception of farmers in their own words. As stated above, the use of mixed method designs provide the opportunity to avoid deficiencies and weakness that come from using a single method.

### 2.2.2. Sampling Technique and Sample Size Determination

Probability sampling technique was used to select the study area, sample kebeles and sample respondents. For this, multi-stage sampling procedure was employed. First, stratified sampling is applied to group kebeles with the same agro-ecology because nature of study area was heterogeneous and then proportional allocation method was used to select sample kebeles and respondents to

obtain representative samples. Then, simple random sampling technique was employed to select sample kebeles and respondents in each stratum which helps to get representative sample.

For the study, three kebeles Filiklik, Koza and Gulana kebeles from Dega, W/dega and kola kebeles respectively were selected from the three different agro-ecological zones (strata). The study population was 1937 household farmers in the sample kebeles. Sample size was determined from each sample kebele proportional to size method to make equal representation of household farmers in each sample kebele (Yemane, 1967; cited in Israel, 1992).

Mathematically presented as: 
$$n = \frac{N}{1+N(e)^2} = n = \frac{1937}{1+1937(0.07)^2} = 184$$

Where, n = designates the sample size the research uses; N = designates total number of household farmers in all sample kebeles (1937);

e = designates maximum variability or margin of error 7% (0.07);

1= designates the probability of the event occurring.

Based on the above formula the sample household farmers were 184.

### 2.2.3. Data Sources and Data Collection Methods

This research used both primary and secondary data sources. Primary data was collected from sample respondents, FGD and key informant interviews. Secondary data were gathered from all available published and unpublished documents and reports.

### 2.2.4. Methods of Data Analyses

After collection the data through different methods, analysis was made using both quantitative and qualitative methods to address the research objective. Analyzed using Statistical Package for Social Sciences (SPSS) 20.0 version and Microsoft Excel spreadsheet. For trend analysis of crop production simple linear regression was used.

## 3. RESULTS AND DISCUSSIONS

### 3.1. The Impacts of Climate Change

Climate change is expected to have adverse ecological, social and economic impacts. As it is presented in the following figure (fig.1), the respondents

replied that major impacts of climate change including drought (87%), stress (82%), increasing temperature (80%), scarcity of water (83%), decreasing food crop (71%), floods (45%), displacement (62%), water born disease (78%), early offset rain (69%), late onset rain (63%), malaria (69%) and conflicts (47%) in the study

area. This implies that drought, scarcity of water, stress and increasing temperature were the first, second, third and fourth impacts of climate change respectively in the study area. The results are also confirmed similarly through FGD and key informant interview.

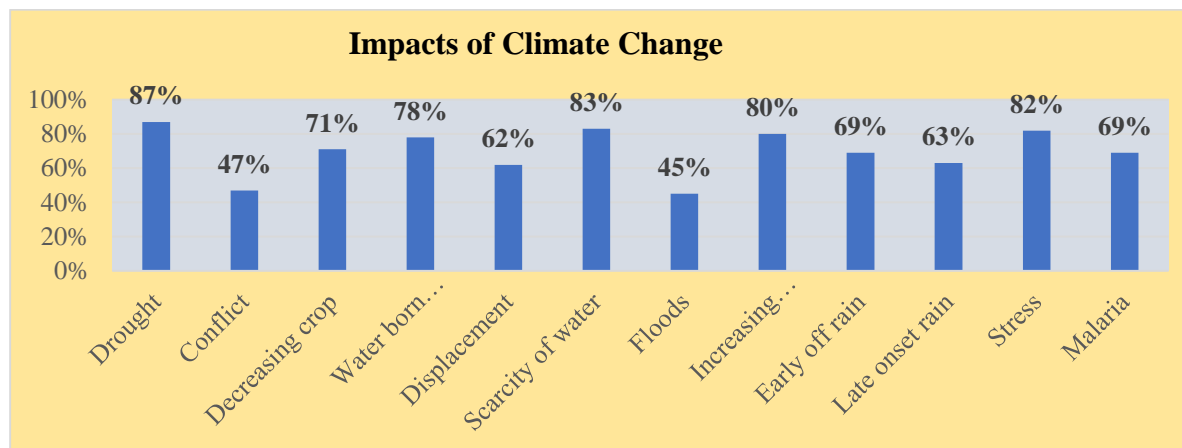


Figure 1: Impacts of Climate Change in the study area

Declining crop production is one of the impacts of climate change. Crop production is characterized by rain-fed, traditional, small scale, subsistence orientated and labor intensive and which have various problems. As can be seen from the following figure 2 below, there was declining with variability trend in crop production in the study area. The result shows that declining with variability trend in crop production in the study area is confirmed by both FGD and key informants. This also coincides with (Woldeamlak, 2009) crop production decline mainly attributed to weather events such as, drought, late onset, erratic rain and early offset of the rain.

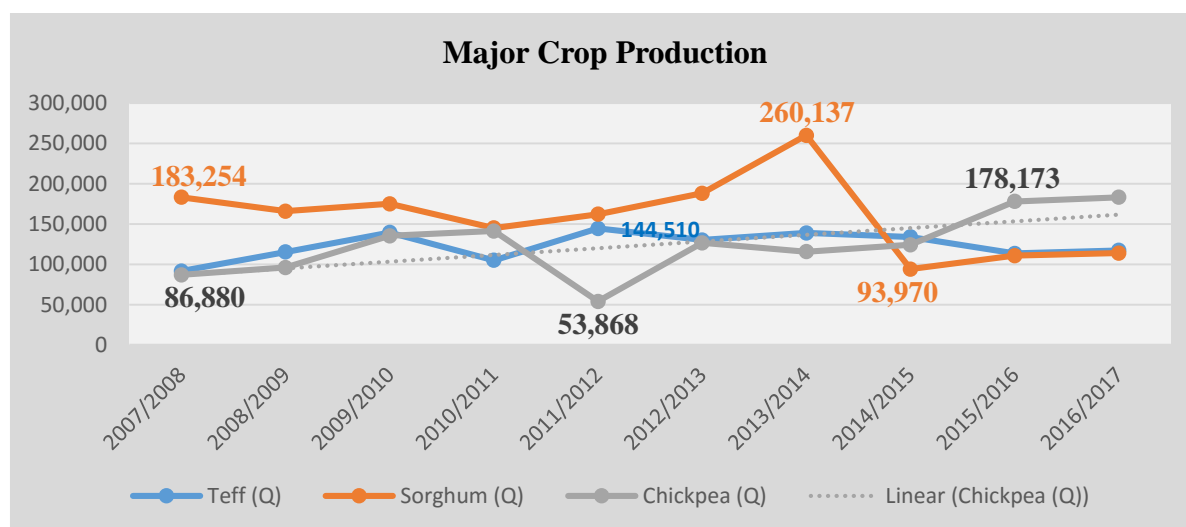


Figure 2: Crop production trends in the study area

**3.1.1. Impacts of Climate Change on Women and Men**

As it is presented in Figure 1 above, drought (87%), stress (82%), increasing temperature (80%), scarcity of water (83%), decreasing food crop (71%), floods (45%), displacement (62%), water born disease (78%), early offset rain (69%), malaria (69%) late onset rain (63%) and conflicts (47%) were the major impacts of climate change in the study area. However, as shown in figure three below, these impacts affects women and men differently. For instance, stress (70%), scarcity of water (62.5%), water born disease (63.4%) and drought (54.2%) were the first, second, third and fourth impacts of climate change replied by women respectively. Floods (76%), displacement (63%), early offset rain (55%) and late onset rain were the first, second, third and fourth impacts of climate change reported by men respectively. This implies that the impacts of climate change affects women and men differently. This also coincides with (Tesfamichaael, 2016). Both women and men are vulnerable to the effect of climate change but it affects differently due to their different roles, access to resources and information.

Both FGD and key informants confirmed similar results. They also added that women more affected by climate change impacts because of their triple roles and limited access to resources and information, limited mobility and voice in community. Hence women much more vulnerable than men to the impacts of climate change. Because women have responsibility to care sick people in addition to fetching water, caring the household, cooking, washing and cleaning. Moreover, the key informants said that “women exposed for physical, mental and emotional strain or tension caused by their triple roles and overworking their mind, and body. Due to these reason women are more affected by climate change impacts than men in the study area.

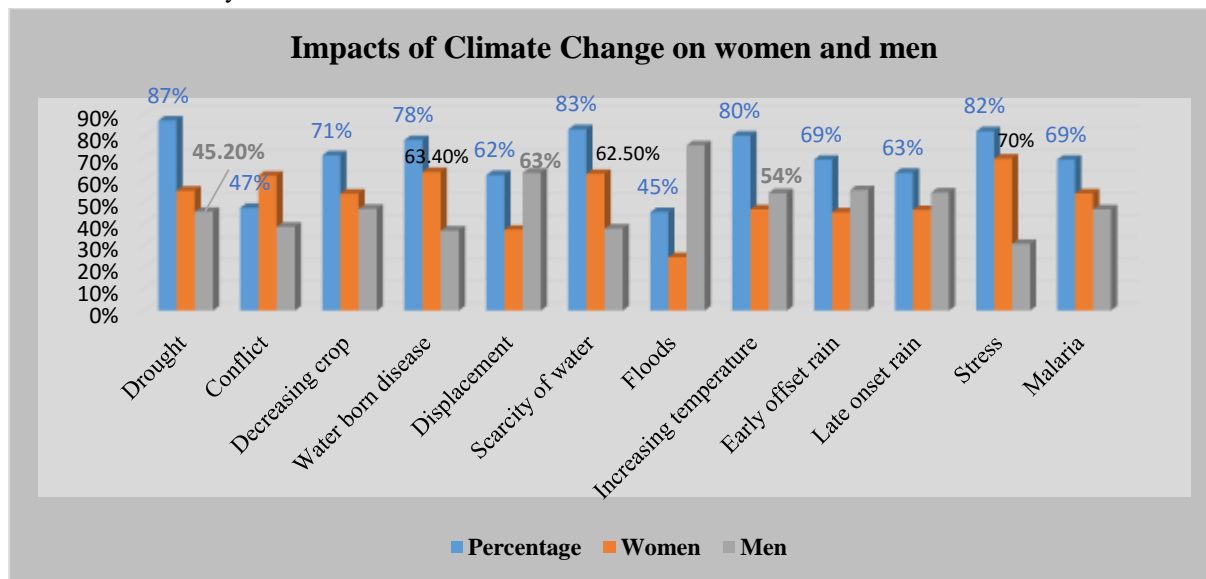


Figure 3: Impacts of Climate Change on Women and Men (multiple responses)

**4. CONCLUSIONS AND RECOMMENDATIONS**

The overall objective of this study was to assess the gender dimension impacts of climate change at West Bellessa District, Northeast Ethiopia. Specifically, the

study identified the impacts of climate change and its impacts on women and men in the study area. The result of the study indicated that major impacts of climate change include drought, stress, increasing temperature, scarcity of water, decreasing food crop, floods, displacement, water born disease, early offset rain, late

onset rain, malaria and conflicts in the study area. However, these impacts affects women and men differently. Stress, scarcity of water, water born disease and drought were more affecting women. Floods, displacement, early offset rain and late onset rain were more affecting men. This results are also confirmed through FGD and key informant interview. The FGD and key informants also added that women more affected by climate change impacts because of their triple roles and limited access to resources and information, limited mobility and voice in community. Hence, any climate change adaptation strategies should consider gender issues.

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