Extended Abstract
Please do not add your name or affiliation

Paper/Poster Title	Current and Past Climate Variability, and Malnutrition among Farming Households in Ethiopia

Abstract prepared for presentation at the 96th Annual Conference of the Agricultural Economics Society, K U Leuven, Belgium

4th – 6th April 2022

Abstract	***200 words max***

Unlike existing studies that examined the effects of climate variability by relying on current weather conditions disregarding the long-term influence of historical weather patterns, we jointly estimate the effects of both current and past weather variability on rural households' nutritional status. Using three waves of nationally representative panel data from rural Ethiopia, we show that the nutritional status of farming households, measured by daily intakes of micro-and macronutrients, is more sensitive to past weather variability than the current weather condition. Our result also suggests that the effects of past weather variability on households' nutritional status could be due to weather variability-induced some behavioural responses that are associated with the deterioration of nutritional status, including reductions in the market participation rate and increases in the size of land allocated for low-value, less nutritious staple crops. As a result, the effects of adverse weather patterns can be considered as regressive in nature. Finally, we present empirical evidence on the role of livestock ownership as a buffering mechanism against past weather variability.

Keywords	Weather variability; Diet Quality; Poverty Trap
JEL Code	D13; I3; Q15; Q54

Introduction	***100 – 250 words***

Numerous studies examined the implications of weather variability on food and nutrition security, and diet quality. These studies examined the effects of weather variability in one season disregarding the long-term influence of historical weather patterns. By doing so, they overlook the long-term consequences of weather variability. However, since most agricultural decisions are made based on farmers' expectations about the upcoming weather condition, past weather patterns can also affect the availability and accessibility of nutritious food items by influencing farm

investment decisions in future harvest periods. For instance, areas with historical weather variability might adjust their business and livelihood activities to mitigate the effects of current weather variability. Recurring shocks in the past could also leave households with inadequate time to recover before encountering later shocks**.** Hence, separating the effects of current and past weather variability is vital to thoroughly understand the impacts of weather variability. To this end, few recent empirical works engaged in disentangling the effects of current and past weather patterns. These studies emphasized the effects on agricultural production, rural livelihood diversification, and farm income. However, weather variability could also affect household consumption as in most cases the production and consumption decisions of agricultural households facing imperfect markets cannot be separated. Therefore, we contribute to the literature by focusing on the effects of current and past weather variability on the availability of micro-and macronutrients of rural households of Ethiopia where widespread historical weather variability and the high level of malnutrition exists.

Methodology	***100 – 250 words***

We mainly rely on the three rounds of, a geo-referenced, Living Standards Measurement Study. As indicators of nutritional status, we consider the availability of calories, protein, iron, zinc, and calcium. The selection of these indicators is guided by previous studies and the prevalence of the deficiency of the selected indicators in the country. Following the recommendation of studies undertaken in East Africa that argue agricultural productivity in the region can only be explained by a complex link between precipitation and temperature variability, we consider the Standardized Precipitation Evapotranspiration Index (SPEI), as our weather variability indicator. Accordingly, weather conditions during the agricultural seasons approximate current weather variability and, we proxy historic weather variability by the coefficient of variation computed using SPEI of the main agricultural seasons within the previous ten years prior to the survey period. We use household fixed-effects regression approach to estimate the effects. Although we see the incidence of weather variability to be beyond the control of farm households, this framework helps to improve our identification by accounting for any time-invariant household heterogeneities such as

taste, preference, and religion that may determine consumption patterns and the extent of the effects of weather variability. It also purges the effect of any time-invariant community-level unobserved characteristics such as soil fertility, agroecology, and other environmental features that influence the types of crops produced in the community.

Results	***100 – 250 words***

Our results consistently show that the association between current weather conditions and nutritional status is not statistically significant. The result implies that farm households smooth their consumption from the adverse effects of current weather variability. A close look into households' self-reported coping strategies shows that only 0.56% of the total surveyed households had changed their eating patterns to cope with the drought shock. More than 41% of households either relied on their savings or accessed credit, whereas 36.8% of them relied on strategies that potentially affect households' capital accumulation and productive assets, such as the selling of agricultural assets. As farmers cope with the adverse effects of current weather conditions by relying on strategies that can affect their capital accumulation and productivity, over the long term, recurrent adverse weather conditions may lead to a worsening nutritional situation. We find that adverse past weather variability limits the availability of calories, protein, iron, calcium, and zinc significantly. The other possible justification for the worsening of nutritional status due to past adverse weather conditions could be that adverse weather history might stimulate some responses that are associated with the deterioration of nutritional status. We find a suggestive result that shows both the size of land allocated to the production of non-staple crops and farmers' market participation rate shrink as farmers experience adverse past weather conditions. We also find that past weather variability increases malnutrition in households with fewer livestock units and the effects are not statistically significant for households with more livestock.

Discussion and Conclusion	***100 – 250 words***

We show that the household's nutritional status is more sensitive to adverse past weather variability than current weather conditions. We find that households manage to smooth their consumption in the face of current weather variability by relying on different coping strategies. Our result also suggests that the effects of past weather

variability on households' nutritional status could be due to a past weather variability-induced reduction in the market participation rate and dependence on low-value, less nutritious staple crops. The findings show that climate variability makes it difficult for the country to improve the well-being of rural households and achieve its development goals. Hence, any policies that focus on agricultural development and promoting the nutritional status of rural households need to recognize both current and past climate variability and have to consider the way that farmers are responding to these two forms of climatic stress. A key general policy implication of our results is that, though farmers can withstand the effects of current shocks either through their coping strategies or with the help of the government and other donors, over the longer term, weather variability has a far-reaching effect that could aggravate the problem of malnutrition. We also underscore the importance of more interventions and additional research work that can assist policy-making in the process of strengthening the resilience and adaptive capacity of farmers. For instance, the effectiveness of specific policy responses, such as rainfall insurance that compensates farmers based on current shocks, could vary based on past weather experience.