THESIS TITLE: CLIMATE FINANCE, CLIMATE CHANGE, BIODIVERSITY LOSS AND SUSTAINABLE DEVELOPMENT

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ABSTRACT: Discussions regarding the triple planetary crises and sustainable development have emerged as focal points in modern debate across both international and local platforms, with an escalation in intensity over the past decade. This discourse indicates that climate finance and sustainable agricultural production are essential for propelling developing economies toward sustainable growth, with agricultural investments proving more effective in alleviating poverty in these regions than growth from other economic sectors. Nevertheless, current empirical research does not address the impact of climate finance on agricultural production and economic growth during climate change and biodiversity decline. This thesis analyses the ecological footprint as an indicator of climate change and biodiversity loss, alongside climate finance, and presents evidence of their effects on agricultural production, food inflation, and economic growth in Africa.

The thesis comprises three independent empirical chapters (Chapters 2, 3, and 4) together with introductory and concluding chapters (Chapters 1 and 5). This thesis aims to analyze the impact of climate finance and ecological footprint on agricultural productivity, food inflation, and economic growth in Africa. The objectives of the three empirical chapters are as follows: (1) to determine the influence of ecological footprint, climate finance, climate adaptation finance, and climate mitigation finance on agricultural production, while providing further evidence of the moderating effect of climate finance on the relationship between ecological footprint and agricultural production; (2) to analyze the impact of climate finance and ecological footprint on

food inflation, as well as the moderating role of climate finance in the relationship between ecological footprint and food inflation; (3) to investigate the role of climate finance, ecological footprint and agricultural production on economic growth and how climate finance moderates the nexus between agricultural production and economic growth. This study addresses the first objective outlined in Chapter Two of the thesis by examining how climate finance and ecological footprint affect agricultural production in twenty-eight African countries from 2012 to 2021. The analysis employs the two-step system generalized method of moment and robust quantile regression techniques. The findings indicate that ecological footprint positively impacts agricultural production in Africa. Furthermore, it appears that countries with lower agricultural productivity predominantly depend on higher levels of ecological footprint to enhance their agricultural output. In contrast, the additional advantages of ecological footprints for agricultural production appear to diminish in countries with higher productivity. Similarly, climate finance is a positive and significant predictor of agricultural production in Africa. However, for countries with high agricultural production, additional climate finance may be associated with a marginal decline in output. The findings further indicate that an increase in climate adaptation finance results in a slight increase in agricultural production, but this effect is observed only in countries characterized by high agricultural productivity. Furthermore, the findings reveal that an increase in climate mitigation funding leads to a marginal increase in agricultural production, evident only in countries with low agricultural productivity. As a moderating variable, the study found that climate finance weakens the impact of ecological footprint on agricultural production particularly in countries with low agricultural productivity.

In the third chapter, the study investigates the impact of climate finance and ecological footprint on food inflation across twenty-eight African countries between 2012 and 2021. Employing the

two-step dynamic system generalized method of moments and robust quantile regression models, the study indicates that the ecological footprint contributes to the reduction of food inflation in Africa, especially in countries that are least affected by food price increases. Similarly, climate finance contributes to reducing food inflation in Africa, with a notably stronger effect observed in countries that face moderate inflation exposure. However, this influence is less significant in nations experiencing high levels of food inflation. As a moderating variable, the study found that climate finance significantly weakens the impact of ecological footprint on food inflation particularly in countries experiencing moderate-to-middle levels of food inflation compared to countries with low food inflation exposure. Furthermore, in countries facing the highest levels of food inflation, an additional increase in climate finance seems to slightly diminish the effect of ecological footprint on food inflation; however, these reductions are not significant enough to erase the overall strong negative impact of ecological footprint on food inflation.

In the fourth and final empirical chapter, the study examines the impact of climate finance, ecological footprint and agricultural production on economic growth in Africa between 2012 and 2021. Employing the two-step system generalized method of moments and robust quantile regression estimations in a panel of twenty-eight African countries, the study reports that agricultural production is a significant and positive predictor of economic growth. Notably, agricultural production has a substantial impact on economic growth in nations that are already experiencing higher levels of economic performance. The study further indicates that ecological footprint adversely affects economic growth more significantly in countries with lower growth levels compared to those with higher growth rates. Furthermore, the study reports that climate finance promotes economic growth, as increases in funding correspond with further growth in nations that are already enjoying high levels of economic growth. The findings reveal that, as a

moderating variable, higher levels of climate finance diminish the marginal effect of agricultural production on economic growth. This effect is particularly evident in nations that are already experiencing strong economic growth. However, the negative impact of climate finance does not completely erase the positive contribution of agricultural production to growth in these countries. The study makes the following policy recommendations. Policymakers should direct climate finance towards transitioning from subsistence farming, which relies on environmentally intensive growth, to more resilient, climate-smart production and sustainable programs. These initiatives must strike a balance between immediate production growth and long-term resilience, ensuring that agricultural practices remain environmentally sustainable and economically viable for future generations. The study further recommends that policymakers should channel climate adaptation financing to countries with high agricultural productivity. However, it is equally important to target low- and medium-capacity agricultural-producing countries to prevent the benefits of adaptation finance from being disproportionately allocated to those with high agricultural productivity. Policymakers must also incorporate climate change considerations into their monetary forecasting frameworks. This integration will enable the inclusion of climate related risk factors, thereby accurately reflecting the true impact of climate change on food inflation. Policymakers should focus more on climate-smart agricultural practices, since the sector is more important in sustaining and accelerating growth among economies already performing well. Furthermore, governments and donor agencies must effectively tailor sustainability policies. For low-growth economies, urgent interventions are needed to decouple growth from ecological degradation, while higher-growth economies must focus on long-term sustainability transitions. Finally, policymakers should integrate climate finance with agricultural modernization rather than treating them as substitutes.

This is because the moderation effect suggests climate finance is steering economies toward sustainability