Trinh Pham | Research Statement

This document discusses my research agenda and my plan for future research. For a full version of the statement, including details on motivation, findings, and implications of my past and ongoing research, please refer to https://www.trinhttpham.com/research/ResearchStatement_Pham.pdf

Research Agenda

My research aims to understand two big questions. First, to what extent and how are farming households in particular, and the economy in general, affected by and adapting to climate and environmental changes. Second, given climate change's negative effects on human capital, sectoral productivity, and occupational safety risks, how we can improve the quality of the workforce to keep up with foster migration into skill-intensive, non-agricultural jobs for sustainable development.

To reach this goal, I break these issues into the following questions. First, how do modest, frequent rainfall shocks affect rural household-wellbeing, child health, education, and labor outcomes and how might these differ across ethnic groups, thereby perpetuating ethnic inequality intergenerationally (**The Child Education and Health Ethnic Inequality Consequences of Climate Shocks in Vietnam**, *Economics of Education Review*, 2022)? Second, how do climate and environmental change affect the structural transformation process of a developing country, and how does such a relationship vary across spaces depending on the degree of market integration, and across individuals depending on the cost of switching sectors (**Climate Change and Intersectoral Labor Reallocation in a Developing Country; Structural Transformation, Agriculture, Climate, and the Environment,** *Review of Environmental Economics and Policy, 2023***; The Intertemporal Evolution of Agriculture and Labor over a Rapid Structural Transformation: Lessons from Vietnam,** *Food Policy, 2020*)? Third, how does climate change affect the adoption of labor-augmenting technologies (e.g., mechanization and pesticides) and land-augmenting technologies (e.g., irrigation and fertilizers) by farming households in response to climate-induced outflow of labor from the agricultural sector (**Heat and Agricultural Transformation***)*? Fourth, what are the effects of heat and air pollution across the lifecycle (early childhood, school age, youth transitioning to the labor market, prime-working age, and the aging population), especially in developing countries (**Meta-analytic Review of Climate and Air Pollution Impacts on Human Capital**)? Fifth, how does providing information and career mentoring affect students' decision to enroll in Technical and Vocational Education and Training (TVET) and Science, Technology, Engineering, and Math (STEM) (**Career Mentoring and Educational Choices: Evidence from Field Experiments in Bhutan**)?

Future Research

I plan to continue this research agenda at the nexus of environmental and climate change, agriculture, and human capital. In what follows, I discuss in detail some of the research questions I plan to explore and the approaches I anticipate taking to study them.

First, given the heterogeneity in climate and environmental change impacts across spaces, the increasing interdependence of production and consumption has at least two implications: (i) a local shock might affect not only local economies but might also propagate through these networks to affect production in other places, and (ii), a reduction in goods supply due to a local shock might create opportunities from suppliers from other places. The coffee leaf rust epidemic in Colombia and Central America in 2012 provides an example. The outbreak negatively affected coffee production in

the region, likely threatening the livelihood and food security of workers who make their living in the industry, especially small farmers and seasonal workers. Because the disease could cause heavy defoliation and death of branches, which decreases the translocation process toward the branch tips and the branch growth, the 2012 epidemic ended up resulting in secondary yield losses up to several years after. Losses in coffee production in the region were expected to be compensated by increased production in other large coffee exporting countries including Ethiopia, Brazil, and Indonesia. How does this epidemic affect livelihood and well-being in regions that are directly and indirectly impacted? Are the effects on human capital, labor, and welfare asymmetric between places with negative versus positive agricultural shocks? Given that these questions cannot be answered by reduced-form analysis because of general equilibrium effects, I plan to study them using a spatial general equilibrium framework, exploiting spatial and temporal variation in the weather conditions suitable for the development and transmission of coffee leaf rust disease, and multiple data sources from major coffee producing countries.

Second, rising temperatures and rainfall make many parts of the world more suitable for dangerous but often neglected infectious diseases. This includes an uptick in mosquito-borne diseases like malaria and dengue. In many tropical countries, however, places that used to have optimal temperature for malaria transmission might now become too hot for this disease, but more suitable for transmission of dengue and other viruses by the yellow fever mosquitoes. In Vietnam, malaria control has experienced remarkable progress, with low to no risk in areas including Ho Chi Minh City and Hanoi. However, frequent urban flooding during the annual typhoon season (July to November) and improper waste management, especially domestic waste along rivers and canals, likely make these places ideal breeding ground for mosquitoes, causing elevated risks of dengue fever outbreak. In 2022, Ho Chi Minh City observed a 7-fold surge in the number of dengue cases compared to the previous year. As these disease outbreaks represent not only a major threat to public health, but also negative shocks to economic outcomes, including labor productivity and labor supply, understanding the links between climatic conditions, urban flooding, waste, and dengue fever outbreak will help provide solutions to prevent outbreaks. For example, reducing debris and waste in the drainage system might help reduce blockages, thereby alleviating the risk of flooding. Similarly, empowering locals to clean up trash near their households likely helps remove breeding grounds for mosquitoes. I hope to develop this line of research using field experiments in collaboration with local authorities and health departments.

Third, following the current project **"Heat and Agricultural Transformation"**, I plan to formally study the role of institutions in climate adaptation of farmers. Agricultural institutions play an important role in agricultural productivity and input allocation. For example, the higher measured institutional distortions in the North of Vietnam, relative to the South, are associated with a reduction of agricultural productivity by 47%, with two-thirds of that is driven by farmers' choice of low-productivity crops and low productivity-enhancing investment (Ayerst et al. 2023). My focus will be on how these institutional distortions might affect farms' choice of crops and investment in response to climate change, and whether farmers will be better adapted if these distortions are corrected.

References

Ayerst, S., Brandt, L., & Restuccia, D. (2023). *Distortions, Producer Dynamics, and Aggregate Productivity: A General Equilibrium Analysis* (No. w30985). National Bureau of Economic Research.