PROJECT TITLE: Examining food-health-environment nexus in developing countries.

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Project keywords: food system, environmental impact, health risk, developing countries

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Project description:

The food systems in the developing countries have witnessed critical change in recent decades. An improvement of productivity become possible due to mechanization and technical advancement; food chain has been extended by inter-regional trade; food consumption patterns have been transitioning from starchy-food-dominant style to more animal-based products as a result of the rapid socio-economic transformation. Such shift has significantly recharacterized the impact of these food systems on the ecological environment in terms of greenhouse gas emissions, water scarcity and contamination, land degradation, etc. as well as multiform malnutrition such as excessive intakes of sugar, trans fat, and red and processed meat. To date, understandings are limited on these impacts and their historical changes. As most of these countries are nutritional insecure and environmental vulnerable, it is urgent and critical to take actions and address these interconnected issues simultaneously. A thorough understanding about the food-environment-health nexus in developing countries will facilitate policy makers to target key issues that lead to both the malnutrition problems and environmental impacts in national planning and policies accurately with adaption to the local dietary culture. This will help developing countries to sustain a healthy population and reduce the environmental impact of human activities.

This project will examine the food-environment-health nexus in developing countries and explore the possibilities to improve the performance of the food systems in these countries in pursuing multiple Sustainable Development Goals (SDGs) including zero hunger, good health and well-being, responsible consumption and production, climate action, life below water, life on land, etc. With the help from the supervisor and the mentor, the student will

1) Consolidate multi-sourced datasets for the environmental, health, and social impacts of different food systems in Bangladesh, India, Brazil, Mexico, and China,

2) Evaluate the environmental and nutritional outcomes of individual diets in these countries

3) Explore the driving forces of the transition of these impacts within the context of socio-economic dynamics.

Candidate requirements:

The ideal candidate will need to have background knowledge and course participation in environmental studies, human geography, public policy, public health, economics, or food science. An interdisciplinary interest and skills of statistical analysis, life-cycle-assessment, effect evaluation, and/or health risk analysis are desirable.

Approximate Work Schedule in weeks (desk based/lab/report writing)

The placement will last for 8 weeks with 35 hours per week. The planned schedule is listed below:

Week 1: Data cleaning – China

• Match the Chinese nutrition survey data to the environmental and nutritional records of food items

• Process the matched dataset to form the variables required for the analysis in a single table

Week 2: Data cleaning – India

• Match the India nutrition survey data to the environmental and nutritional records of food items

• Process the matched dataset to form the variables required for the analysis in a single table

Week 3: Data cleaning – Mexico

• Translate the food items used in the Mexico nutrition survey data from Spanish to English

Week 4: Data cleaning – Mexico (continued); data integration

• Match the India nutrition survey data to the environmental and nutritional records of food items

• Process the matched dataset to form the variables required for the analysis in a single table

• Merge the processed dataset for all the countries (plus the processed dataset prepared by the supervisor and mentor for Brazil and Bangladesh)

Week 5: Environmental and nutritional impact evaluation

• Evaluate the environmental footprints of the individual diets in the study areas

• Assess the nutritional quality of the individual diets in the study areas

Week 6: Socio-economic heterogeneity examination

• Conduct descriptive statistics to identify the difference in environmental and nutritional outcomes in the study areas

Week 7: Driver analysis

• Conduct regression analysis to examine the role of socio-economic development on the food-environment-health nexus in the study areas

Week 8: Poster presentation

• Produce a poster to describe the analysis and key findings of the project

• Presentation in the group weekly seminar for comments & feedback

* The nutrition survey data in the study areas have been pre-processed by the supervisor, the PhD mentor, and other members of the research group. Therefore, the supervision team is equipped with the experiences on the structure of datasets as well as the potential issues that the student may encounter when processing the data. The mentor has also developed the analysis framework with previous work on the Brazil nutrition survey data and thus would be able to provide clear and articulate guidance to the student to ensure the progress of the project.

Background reading:

Poore, J. & Nemecek, T. Reducing food's environmental impacts through producers and consumers. Science 360, 987-992 (2018).

Willett, W. et al. Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. The Lancet 393, 447-492 (2019).

He, Pan, et al. "The environmental impacts of rapidly changing diets and their nutritional quality in China." Nature Sustainability 1.3 (2018): 122-127.

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