Working Title: Application of Spatial Agent Based Modelling in Agricultural Economics

Brief Outline:

My research takes a look into developing agent based, demand side economic models of food intervention strategies across large areas of South Asia and Sub-Saharan Africa. The intervention strategies are characterized by novel and innovative agricultural methods for addressing the micronutrient deficiency amongst the population in those areas.

Strategies for deploying new methods to farming are non-trivial. Simply introducing newer, enriched farming products, such as fertilizers, into the market does not mean that local industries will adopt it overnight. Moreover, trust must be established in the local population through widespread dissemination of information regarding the safety and added benefits of the new variants of fertilizers. From the economic standpoint uptake of such interventional products can be monitored through the demand generated for the product in the local markets. As economies consist of heterogeneously mixing entities, interaction between them gives rise to emergent behaviours that might offer insights on the granular level economic activities in a population.

Current economic models try to find aggregate properties of the population as a whole and ignore individual attributes. Such macroscopic view of the economy overlooks the dynamic changes in behaviour of the individual entities that make up the entire population. Furthermore, these models are too static in nature to account for spatiotemporal changes in characteristics of entities over large geographical areas. Neglecting such crucial behaviour can potentially lead to incomplete assumptions about the local population and contribute to developing intervention strategies that may not fully serve the purpose of the intervention.

Therefore, my research will attempt to uncover the granular level characteristics of local economic activities across large geographical regions such that emergent behaviours in local population, in the event of intervention strategies, can be understood and effective measures be taken. Complexity sciences based methodologies, such as agent based modelling, lend ways to looking at economic models and geospatial research through an alternative lens and offer up ways to identifying and addressing the unique behaviour patterns amongst spatially interacting entities. Understanding such existing dynamic economic characteristic in a population would serve as a vital tool in developing effective local policies.