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"Global food security and food safety:
The role of universities"

Agricultural Fertility and Environmental Resources (AFER) in Ethiopia

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Abstract

Ethiopia is the second most populous country in Africa, and projections by the United Nations suggest that the population may double over the next generation (30 years). Given the current levels of poverty and malnutrition, these population trends bring the requirement for increased food production into sharp focus. However, increasing productivity from agricultural land is projected to add further stress to the availability and usage of natural resources. Sustainable intensification refers to increasing total food production from the current global agricultural land area, thus preventing increased competition for land with ecological habitats. Sustainable intensification additionally implies increased production without increasing total inputs of resources such as nutrients and pesticides.

A key first step on the journey of sustainable intensification is the optimisation of soil fertility. In many parts of the world, and especially in the developing world, the nutrient status of soils is suboptimal and one of the principal constraints to meeting the productivity potential of the land. The gold standard to addressing nutrient deficiencies is to assess nutrient requirements by means of soil analyses, followed by nutrient recommendations that are based on the results. For various reasons, including logistics and cost, it is unlikely that large scale employment of farmer-led soil analysis and nutrient advice will become feasible in the near future.

These challenges raise the central question to be addressed by the AFER project: how can we account for major differences between soils in terms of their nutrient requirements, using simple assessment methods that can be made readily available, at low cost, to non-experts? As a solution, we propose that we describe these major differences between soils using the diagnostic approach. The diagnostic approach will allow soils to be categorised into 'bands' for nutrient advice. The result will not be as accurate as the gold-standard laboratory soil analysis, but is likely to be more reliable and robust than a grid-based sampling approach, especially in an Ethiopian context. This approach for generating soil fertility recommendations and AFER project work in Ethiopia will be discussed in more detail in this paper.

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