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# Smart Farming for Climate Resilient Crops: Toward Sustainable Agriculture

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The number of people unable to meet their daily food needs is still increasing. In 2018, more than 113 million people across 53 countries experienced acute hunger requiring urgent food (FSIN 2019) and around 821 million people - one in every nine - were malnourished in 2017, up from 815 million in 2016 (SOFI 2018). One of the primary drivers is the adverse climate events (FSIN 2019).
According to the Secretary-General of the United Nations, “determined action is needed to uphold this pledge... Let us all commit to building societies without hunger” (FSIN 2019). The Second Sustainable Development Goal (SDG2), one of UN’s goals, presents the ambitious target of ending hunger globally by 2030 (UN 2015). To that end, it is imperative that we accelerate and scale up actions to strengthen the resilience and adaptive capacity of food systems in response to climate variability and extremes (SOFI 2018). For agricultural productivity to be improved over the next years, breeding must achieve unprecedented increases in yield and resource-use efficiencies while safeguarding harvests and preserving the environment.
The capabilities of big data analytics and artificial intelligence (AI) have increased our ability to address major problem (Watson 2010) such as sustainable agriculture challenges by using information systems, i.e., assimilating large amounts of data into meaningful interpretations using AI. For instance, farmers can combine their empirical knowledge to accurately analyze data from the current growing season, compare it with previous years, and predict next year season, what is called “smart farming”. Smart farming will dramatically reduce the number of field sites, trials and their duration needed for breeding. Farmers can thus predict which variety or varieties would work best in a specific environment and what soil conditions are likely to be favorable. This approach will also turbocharge valuable and underexploited germplasms, thus increasing the available genetic diversity in breeding gene banks.
We are trying to generate a research program on the potential impacts of AI on solving major challenges in the agriculture by incorporating big data analytics to bridge genomics with phenomics to accelerate crops breeding.

**References**
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