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## Big data challenges and opportunities in the developing world

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Population growth and globalization bring numerous challenges - food security, environmental degradation, peace and security. Human-related activities and natural phenomena immensely impinge on our livelihood and sustainability of life on earth. The 17 UN Sustainable Development Goals (SDGs) exhibit the multivariate nature of sustainable development. In a typical developing country, these data attributes will be high-dimensional, multi-faceted and fragmented. This talk will explore and attempt to balance the technical and logistical challenges and opportunities of extracting knowledge from these attributes. It touches on the intricacy of harnessing and gaining meaningful insights for supporting informed decision-making processes. Illustrations are based on enhanced unsupervised and supervised modeling tools, methods and techniques and the results underline the need for interdisciplinary collaborative research. The capacity for these tools and methods to learn rules from data are typically constrained by the random nature of training and test data; diversity and disparity of models and related parameters and limitations in data sharing. Hence, the mantra of collaborative interdisciplinary research highlights typical challenges and opportunities that derive from shared knowledge and openness as to who is doing or did what, where, when and how. A prototype project idea Agro-Data Dynamics (ADD) - an open data-driven initiative for improving farming practices, productivity & human livelihood in East Africa is used to illustrate existing challenges and opportunities. A framework for agro-forestry data repositories on soils, vegetation, income, and other socio-economic and cultural attributes is proposed for formalizing what we know, what we don't, what we can and can't do.

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