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| **Project template** | |
| Title / topic | Potato yield forecasting using satellite images |
| Team (names and institutes) | 1. Mustafa Kamal Shahadat, SO, OFRD 2. Ummy Kulsum Mukta, SO, ORC 3. Istiak Ahmed, SO, ASICT |
| Description, including the problem, methods and expected results | *Crop type discrimination and mapping using remotely sensed satellite data are very crucial in the context of acreage estimation, yield prediction, food security measures, and for developing agro-economic policies. The accurate and reliable crop type map at various spatial scales offers an essential way for precise acreage and yield estimation, and thereby indispensable for decision-makers to establish regional to global food security measures (Parida and Ranjan 2019a). On the other hand, the prediction of crop yield before the harvest is one of the most significant concerns in agriculture since variations in crop yield from year-to-year impact international trade, food supply, and market prices. However, both crop statistics and yield estimation are estimated usually through conventional means (field experiments or surveys). Currently, remote sensing techniques are using to measure these statistics at high spatial and temporal resolutions. The application of remote sensing in estimating agricultural performance indicators is increasing as it offers a time and cost-effective reproducible method for measurement that can cover larger physical areas as compared to in-situ methods (Sadras et al., 2015).*  In this study, satellite data and field-based survey data will be used for potato crop mapping, yield prediction before harvest, and yield forecasting in future along with adaptation strategies. In particular, the Sentinel-2 satellite data will be utilized for potato area mapping using supervised classification techniques. Based on yield data from the farmer's field and vegetation indices (e.g. NDVI) value generated from the same fields using Sentinel-2 imageries, a regression model will be developed, which will be applied further to obtain potato yield maps from the NDVI maps. This study will find the best model to predict yield before harvest. |
| Data to be used | *Sentinel-2 images and yield data of Munshiganj District, Bangladesh.* |
| Possible topics for Phase 4 tutorials, demonstrations etc. | *Exploratory Data Analysis and Exploratory Spatial Data Analysis, Machine Learning (ML), Unsupervised Learning, Decision Tree and Random Forest, Artificial Neural Networks, Big geodata, Distributed Computing and Google Earth Engine.* |
| Possible supervisors based on the topic/expertise | *Mahdi Khodadadzadeh & Mahdi Farnaghi* |
| Other | *N/A* |