

Combating Climate Change For Food Security through the Digital Five Forces

The dramatic onslaught of a rapidly increasing global population, shrinking percentage of arable land, reduced water availability and the influence of climate change has increased the vulnerability of the future of world agriculture and food security, thereby threatening the existence of Life as we know it. It is estimated that each degree Celsius temperature increase, on average reduces the yields of wheat by 6%, rice by 3%, maize by 7% and soybean by 3%. In a world where close to 800 million people are suffering from chronic undernourishment and malnutrition today, this is going to further exacerbate the situation. To address this problem, it is necessary that we rethink and reform the various practices traditionally followed in agriculture. TCS Digital Farming Initiatives approached this problem by harnessing the **Digital Five Forces** – Social Networks, Mobility, Analytics, Cloud and IoT – to create “Market Smart” and “Climate Smart” entities called **PRIDE™s (Progressive Rural Integrated Digital Enterprises)** to support Governments in their endeavor to achieve food security.

In this paper, we present our suite of flexible multi-pronged technologies, **InteGra™**, for powering the PRIDE™s and transforming them into localized economic powerhouses that can withstand the various adverse global forces. This consists of the creation of patent pending, personalized farm-specific protocols, **Farmocols™**, through an algorithmic approach based on statistical machine and deep learning techniques. Data ranging from macro remote sensing information down to micro, farm level IoT derived information is leveraged for this. PRIDE™s have been created across various states in India and have had a transformative effect in the lives of small and marginal farmers moving them towards a future of economic prosperity and food security.