

# The Future is Green

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Indian agriculture is based on a highly diversified agri production situations comprising 15 agro-climatic regions based on similarity in soil type, climate and captive water resources. ICAR has further segmented these regions into 131 Zones based on suitability of resources for targeted agri production- with such a diverse agro-climatic situation, country is able to produce almost all the crops cultivated in any other part of the globe.

With a rich inherent biodiversity, it is not a surprise when horticulture sector is outpacing food grains production and several non-conventional crops have been introduced successfully in one or the other part of the country.

#### Technological advances

Advances in the fields of microbiology, biotechnology, genetic engineering space, High-tech Agri-Inputs, Farm Mechanization, communication technology, Digital Technologies, IOT and related IT enabled technologies have propelled the farm sector into an era of precision agriculture. Equipped with multidisciplinary solutions/ decision support systems, crop nutrition and crop protection sector is now fairly equipped facilitate farm sector in meeting future food & nutritional requirements without losing its focus on ecological sustainability.

#### Focus Of R&D Efforts

Development of new products should be specific to crops and situations, therefore, R&D efforts should be (i) need based and problem solving on the one hand and (ii) validating advanced technologies for adoption as per agro-ecological situations on the other. While adopting a crop cluster-based approach, not only the production prospects are enhanced but post-harvest linkages could also be strengthened.

Alignment of High-tech Agri-inputs, technology including Artificial intelligence techniques and food processing to focused production clusters will add significant value and can appear as big game changer in Indian agriculture.

#### Leveraging Peri-Urban Agriculture

Cultivation of crops in the city outskirts or perimeter of the urban areas is growing with the expansion of existing cities and towns. The farmers are engaged in large scale production systems by setting up polyhouses, animal husbandry, horticulture, beekeeping, mushroom cultivation, agro-forestry, etc.

Most of highly perishable seasonally and regionally available vegetables and fruits are cultivated and sold under this system. It is also noticeable that peri-urban agriculture system is generating significant employment opportunities, helping in recycling urban wastes and strengthening cities' resilience to climate change.

Company owned retail outlets can play a significant role in offering access to inputs, technology and information and facilitate peri-urban farmers.

#### Farmers-Led Extension: Reaching Progressive Farmers

These farmers are always looking for newer products and practices and can be located in almost every production catchment. This target group will accelerate adoption of technologies and demonstrate realize their impacts resulting into a long-term association. These target groups will help in motivating other farmers to adopt the proven technologies.

#### Bonding with FPOs

Fragmentation of land holdings has made them economically unviable-farmers operating on such smaller units are not able to make use of advanced tools and technologies.

Formation of FPOs is being seen as a way to tackle the issues of small and marginal land holders by aggregating their resources and efforts.

There are several mature and vibrant FPOs in most of the states which are/will offer a more meaningful engagement with farming community for agri input as well as crop produce centric organizations. FPOs along with Agri-input companies, financial institutions, and crop produce processing / trading companies and agri-extension education organizations can be a big game changer in Indian Agriculture.

#### Evidence-Based Production (EBP)

Every farm is unique; soils and farming capabilities are different. EBP is set to have a major impact on the productivity of agricultural supply chains and is defined as "farming that embraces technology and utilizes data to inform production". EBP involves agronomists, advisors, input suppliers, processors and retailers using data to optimize performance; both at the farm level and within their individual businesses.

Evidence-based agronomy seeks the transparent integration of all relevant data and resulting recommended practices with local farm conditions and associated data sets. It has the potential to make the science supporting soil fertility and nutrient management more agile and credible and can increase the impact of the data of nutrient science in a big data ecosystem.

The prevailing extension system in India is inadequate (in terms of skill and resources) leaving a large section of farmers to adopt a "biased advisory" offered by agri-input dealers. Agri input companies are doing fairly well but the agronomists / farm advisors employed also need to be equipped and trained to carryout EBP driven by latest/relevant technologies.

#### Complete Farming Solution - One Stop Platform

Establishment and operation of efficient one stop solution platform from where farmers can not only get complete farming solution including quality agri-inputs and location and situation specific technology to decrease cost of production and increase crop / livestock productivity.

This will help to integrate inputs, technology and resources for having efficient farming system and be a big game changer in Indian agriculture. Considering the diverse socio-economic fabric of rural setting and its implications on agriculture, a general recommendation is not effective.

Agro-ecological situation-based customized approaches should be evolved using relevant data and scientific tools. Having one stop complete farming solution can play a vital role in in doing so.

There are many more potential game changes which have potential to transform Indian agriculture. All associated stake holders including government and Industry need to work in coordination and support to farmers to convert above mentioned high potential game changers into real game changers of Indian agriculture.