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General Note



Article is recommended to print as color version in recycled paper. *Save Plants, Save Climate.*

Balancing the food, water and energy nexus for climate resilience in Indian Agriculture

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World is facing the implications of climate change and serious food crises are adding about 200 million people to the 850,000 million people that are already facing absolute hunger and poverty. To mitigate this challenge, promotion of rain fed agriculture is the order of the day. For instance, the dry areas of the world, which occupy more than 40% of the earth's surface and are the home to more than 2 billion people, are not only the most food deficit areas in the world but also the most vulnerable to climate change given their fragile agro-ecosystems .

Over all, sustainable agricultural development in dry areas faces major challenges:

- Rapid natural resource degradation and desertification, particularly water scarcity due to the variability in rainfall and groundwater depletion.
- Drought, which is becoming a more frequent phenomenon,
- Land degradation due to over grazing and inappropriate soil and water management, as well as salinization;
- Loss of biodiversity due to mono-cropping, overgrazing, incursion of cropping in rangeland areas, and mismanagement of uncultivated and forest areas;
- Biotic stresses including diseases and insect pests;
- Climate change implications, which are already evident in reduced precipitation, more frequent droughts, high temperatures and shorter growing seasons in many countries; emergence of new biotic stresses, including new diseases and insect pests, due to shifts in temperature regimes. As an example, we have recently seen new virulent races of stripe or yellow rust in wheat, resulting in losses of millions of tons of production;
- Climate change implications are not only affecting food production but all four dimensions of food security: food availability (production); access to food (affordability); food stability due to more a biotic and biotic stresses; and food utilization (nutritional problems and food safety).

The complex nature of these challenges requires an integrated approach encompassing the three major pillars for sustainable agricultural development:

1. Sustainable use of natural resources and inputs;
2. Crop and livestock genetic improvement;
3. Appropriate policies, social and economic considerations and institutional support.

The following strategies could make a difference in enhancing sustainable agricultural development in a changing environment:

- Political will and strong political support and an enabling policy environment for investment in agriculture development as a priority area;
- Enhancing the adoption of advances in science and technology (S & T) and supporting agricultural research for development to promote conservation technologies that meet global challenges to food security;
- Sustainable intensification of production systems
- An integrated approach to the sustainable use of natural resources for economic growth.
- Development of regulatory frameworks and adequate policies to ensure sustainable use of natural resources and produce high quality products to protect human health and natural resources.
- Public awareness of the long term benefits of conservation technologies must be strengthened for effective expansion to promote sustainable agricultural development.
- Capacity development and institutional support
- International and regional cooperation and partnerships based on complementarities and comparative advantages.

So, the need of the hour is to have,

- a) A comprehensive National Level Strategy for Sustainable Agricultural Development taking into consideration the food-water-energy nexus in the available land and water resources and successful case studies;
- b) A National Agricultural Research Policy to support the implementation of the Agricultural Development Strategy;
- c) Five year action plans to implement both strategies;
- d) Comprehensive regional or sub-regional cooperation programs to enhance food security;

Nonetheless, a strong political will to put agriculture as a top national priority to mitigate and adapt to the negative impacts of climate change, is the national focus these days, and India is striving hard to infuse institutional mechanisms to

enable climate resilience in the country whereby we are able to equate agricultural production with farmers' income.